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ABSTRACT

Presented in this collection are proceedings from a conference focused on how to go about preserving and protecting the environment and attended by over 120 colleges and universities and some 60 environmental organizations, as well as 10 additional articles on careers in areas related to the environment. Included in the conference proceedings are: a keynote address; 11 panel sessions on topics including hazardous waste management, recycling, jobs in land use, housing and community development, water and air pollution, careers in wildlife management, fund raising, careers in environmental education and environmental communications, and international environmental careers; and descriptions of workshop sessions. The environmental career articles also included in this publication are: (1) "The Environment Is the Future" (Maureen A. Delaney and Clarice E. Gaylord); (2) "Environmental Professionals" (Robert Ehrhardt); (3) "Becoming an Environmental Lawyer" (John Adams and Nina Sankovitch); (4) "International Environmental Protection" (Thomas Fox); (5) "Pollution Prevention" (Dana Duxbury); (6) "Minorities and Environmental Career Opportunities" (Gerry Stover); (7) "The Liberal Arts Major as Environmental Professional" (Allen Schwartz); (8) "Changing Careers" (Barbarb Gilvar); (9) "Volunteering" (Key Drake); and (10) "Observations on the Environmental Field" (John R. Cook, Jr.). (CW)

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Articles from Leading Environmental Professionals on Employment and Career Trends in the 1990s — Plus Proceedings from The CEIP Fund's Sixth Annual Environmental Careers Conference "What on Earth Can You Do?"

BECOMING AN ENVIRONMENTAL PROFESSIONAL 1990

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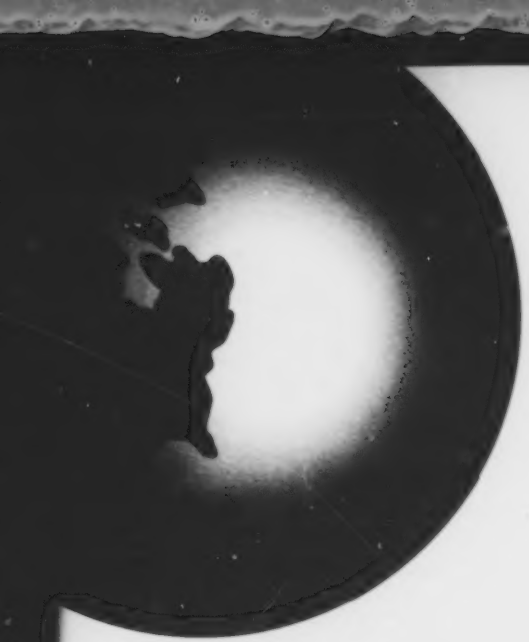

BECOMING AN ENVIRONMENTAL PROFESSIONAL 1990

Articles from Leading Environmental Professionals on Employment and Career Trends in the 1990s — Plus Proceedings from The CEIP Fund's Sixth Annual Environmental Careers Conference "What on Earth Can You Do?"

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Introduction

Since the first National Environmental Careers Conference took place, the event has expanded in its number of participants as well as the scope of topics it has covered. In this, its sixth year, the excitement for the Conference was startling; more and more people want to know about what it means to work for the environment. Since it is impossible for everyone to attend the Conference, we have published the proceedings so environmental job seekers across the nation can benefit from the advice and information that was presented. We have also expanded the publication by combining the best parts of an old design with a new approach. This year we used a more condensed format for the Conference proceedings and complemented them with career articles from leading environmental professionals.

In doing this, we aim to augment our existing environmental career development activities. Our ultimate goal is to protect, preserve and manage our environment with the energy and talent of our most valuable resource, people. People who will be committed to upholding the environmental ethic in both their personal and professional lives.

The Proceedings

The Conference, which took place on October 22, 1989 in Boston, consisted of more than fifty leading environmental professionals talking about their careers and sharing their knowledge about the field of environmental protection. Over a hundred and twenty colleges and universities were represented as well as over sixty different environmental organizations. Most importantly, nearly five hundred participants learned how they could go about starting their careers working for the environment.

This publication is designed to give you an opportunity to experience the conference and all that went on in each of the sessions. You will learn about environmental professionals who have a multitude of backgrounds and are currently working on environmental issues in a variety of different organizations, from the federal government to grass roots nonprofit organizations to large corporations.

In reading these proceedings you will get a feel for what it is like to work for the Island Institute in Maine, to run your own hazardous waste consulting company or even run a butterfly farm in Costa Rica. You will receive advice about how to establish contacts in different fields, what kind of academic preparation you will need, what skills you should try to develop, and what kind of resources are available to aid your job search.

The summaries are an abridged version of both the three speaker panel sessions and the shorter, single speaker workshop sessions.

The panel sessions were one and a half hours long and focused on careers in different environmental fields. The workshops were only a half hour in duration and concentrated on how to go about organizing a job search in different sectors. The insightful keynote address was delivered by Eugene Linden, Environmental Corespondent, *Time Magazine*, and has been transcribed verbatim.

Environmental Career Articles

Every year we make ***Becoming an Environmental Professional*** more substantial in its environmental career pursuits. Because the conference is designed to give concise and relevant information about current opportunities in the field, those who attend often express an interest in the broader perspective of where the field is going as a whole. Accordingly, we are including several articles written by leading human resource management specialists, environmental managers, and even an executive search professional. These articles will take a look at environmental careers in the 1990's and are designed to compliment the more topical information provided in the conference proceedings.

Over the years the conference has evolved beyond those who it was initially designed for, graduate and undergraduate students seeking their first permanent positions, and has begun to attract career changers, career advisors, and professionals who are already in the field. Accordingly, these articles will be of use not only to those looking to start their careers but also to environmental professionals who want to know more about where their current field is heading. As we enter a new decade and a new era of environmental awareness and activism it is important that all of us take the time to examine what our course of action will be.

This publication is designed to compliment the CEIP Fund, Inc.'s primary mission as the nation's environmental careers organization. CEIP is a non-advocacy, non-profit organization dedicated to placing responsible managers in all sectors involved with environmental issues. Through several vehicles such as the placement of short term, entry level professionals; career counseling and planning; an environmental grants program; conferences; seminars and various publications CEIP helps to insure a supply of dedicated and informed professionals who will be better able to solve the difficult challenges facing the environmental work force in the 1990's.

Whether you are just beginning your career or are already in the field this publication will help to answer the pertinent question: "what on earth can you do?"

James S. Cabot
CEIP Associate

Acknowledgments

There are several groups without whose support the conference and this publication would not have been possible. They are: the CEIP staff, former and present, who provided the inspiration and encouragement to bring both projects to their final conclusion; the conference speakers who so generously donated their time to inspire those who are considering entering this important field; the conference note takers who are primarily responsible for writing the session summaries; the conference exhibitors who provided an opportunity for the participants to understand what different organizations are doing in the region; the foundations and corporations that provided the grants which made the event possible; and finally those who took the time to come to the conference and learn about the importance of environmental protection.

I would also like to give special thanks to the career article authors who donated their time and expertise to this publication.

James S. Cabot
CEIP Associate

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Environmental Career Conference Proceedings

Keynote Address

First of all, let me say that I'm absolutely delighted to be here at this laudable and timely conference. When you think back what a difference a year makes, those of you who have gravitated toward environmental careers looking for a tranquil alternative to the mainstream pursuits are going to be profoundly disappointed. The mainstream is heading your way, and for good reason. There's a Chinese proverb that describes our present situation perfectly: If we do not change the direction we are going, we end up where we are headed.

The world is beginning to realize that we must change direction, and since you will be the frontline troops helping in this undertaking, I cannot resist the temptation to try and influence the course of this battle. First I'll make an attempt to place the current environmental crisis in a context of sorts, then I'll devote some time to the pitfalls that face you as environmental professionals.

The world is beginning to realize that we must change direction

Let me start by throwing out a hypothesis. The future viability of humanity depends in some measure on three questions to which we do not now have the answers: Can humanity voluntarily control its members? How resilient is the biosphere? and the third, which has particular pertinence to this group, Can consumer societies adapt? (This third question is a trick question.) To properly understand it, we have to step back a bit, let's say fifteen million years or so. It may seem that I'm venturing a little afield, but please bear with me; it all fits together, or at least it did when I wrote this last week. Were we able to hover over the African rainforest during the Miocene Epoch, what we would not see would be as significant as what we would see. In terms of numbers of species, we'd see lots of proto-apes, ancestors of present-day gorillas, chimps, orangutans and humans, but we would not see monkeys —they hadn't arrived on the scene yet.

Now cut to the present, and this time look around the world, because in the intervening years, simians have walked or swum across various land bridges and populated the major continents. And a survey today shows only five descendants of the apes, and literally scores of different species of monkeys. Moreover, with the temporary exception of one, that's people, all the apes are endangered. "We are", in the words of paleoanthropologist Tim White, "part of a relic evolutionary line." Says White: "Even our incredibly impoverished and restricted view of the past tells us of the diversity of apes that dwarfs what we see today." What happened?

According to White, a principle reason why monkeys have thrived while apes have declined, with the exception of us, has been

a different choice of reproductive strategy. Monkeys produce lots of offspring and grow them up fast. Apes, by contrast, produce just a few offspring, and pour everything into insuring that those kids survive. Moreover, those offspring have to be prepared to maintain the "culture" of the ape community. That takes time, leading to a protracted, and in evolutionary terms, expensive childhood and adolescence. As a result of these different strategies of survival, even though apes began with a huge advantage in terms of numbers and diversity, we now see lots of monkeys, and almost no apes, again, except for one.

I'll let that hang there for a moment, while introducing another idea. Some years back, a young woman named Misia Landau, who had a background in literature, neurology and paleoanthropology, decided she was unsuitable for fieldwork and devoted her attention to examining the way eminences of past and present interpreted the fossils on which we base our theories of human evolution. As reported by Roger Lewin in Bones of Contention, Landau discovered that scientists fill in the huge gaps between these rare fragments of bone, upon which they base their theories, by telling a story.

Those narratives, according to Landau, invariably followed the form of the myth of the hero. The hero, in this case, an ape or prosimian, is expelled from a safe and stable environment, either by climate change or competition, and is then forced to embark on a hazardous journey, during which he overcomes a series of tests, and thereby displays his worth: develops his intelligence, becomes bipedal, that sort of thing....Is tested even more heroically by an ice age or two, until he achieves his ultimate triumph by emerging as a full-blown human being.

It's a nice way of looking at things, except for the fact that evolution is not a goal-directed enterprise and evolution does not hand out awards for best species.

But then Landau points out something else which is very interesting. Again and again in myth, the hero, having accomplished great deeds, succumbs to pride, or hubris, and is destroyed. She goes on to say: "In many narratives of human evolution there is a similar sense that man may be doomed, that although civilization evolved as a means of protecting humanity from nature, it is now our greatest threat." Which is to say that the strategy for survival that enabled us to triumph, against the odds, for our relic position of a natural order is now catching up with us.

Now the great genius of humanity has been our ever-increasing ability to manage nature to our short-term advantage, and therein lies the hubris Landau referred to. Through a combination of increasing numbers and increasing material aspirations, this strategy has become unsustainable. Now unsustainable means simply that: The thing in question cannot be sustained; that it will cease, collapse or otherwise change.

The question in this case is the way ever-increasing numbers of people use the world's resources. In much of the Third World, people mortgage their future and the future of countless other species for survival, as numbers exceed the carrying capacity of their environment. In the developed world, we mortgage the future for ever-increasing convenience and an illusion of security.

Now you've all read much about the environmental crisis by now, otherwise you wouldn't be here. I don't really want to plow over familiar ground. So let's assume for the sake of argument, this morning, that the doomsayers are right: That under the dual stresses of population and greed, the human economy has shifted from husbandry to mining; that throughout the globe mankind is engaged in a one-time fire sale of earth's assets. What does this imply? It implies that humanity has to change. The third world has to control its numbers and their impact on the environment, or nature will control them in the most brutal fashion. And, according to Lester Brown, this is already happening in parts of Africa. The developed world has to control its appetites, and the means it uses to satisfy them, or it risks destroying most of the ecosystems that support much of life on earth, including humanity.

In the developed world, we mortgage the future for ever-increasing convenience and an illusion of security

This raises another problem: While we may know that business as usual is unsustainable, we don't know what is sustainable. Particularly for modern industrial societies. I don't see many people, in the course of the day, who would opt for a return to hunting and gathering, and ancestor worship, for instance. And most so-called "primitive" societies would not be sustainable if scaled up, anyway. There is no off-the-shelf model available to the U.S. along with the rest of the industrial world. We're going to have to invent sustainable modern society as we go along. Opportunistically gravitating to cleaner fuels, more efficient manufacturing and agriculture, and perhaps giving up some of our cherished luxuries.

But I submit that remedial measures will not be enough, and this brings us back to that third question I posed at the outset: Can consumer society adapt? Is it able to change? From what I've seen, and as for now I would distrust any clear assertion on this question one way or another, standing in the way of change are a number of things, not least among them the fact that a good number of decision makers, in business and government, cling to the belief that the environmental crisis, if it exists, can be solved within the consumer paradigm. Which is to say that management and technology which got us into the fix will get us out of the fix. Energy efficiency? New light bulbs,... alternative fuels. Solid wastes? Recycling. The poisoning of the land and water by chemical fertilizer and pesticides? Biotech-produced natural alternatives. Acid rain? Scrubbers, new

fuels and better emission controls. The Greenhouse Effect? Again, new fuel. Or, as one physicist suggested, seriously, loft giant mirrors into space to reflect solar radiation to compensate for global warming.

Now, the last example is absurd, but it illustrates the point: We're a society with a gun to our heads, and rather than putting down the gun, we'd prefer to put on a helmet. Biotech can help, and so can clean fuels and cleaner manufacturing techniques. The problem is that without some change in the way we understand and respect the workings of natural systems of which we are a part, almost inevitably the law of unintended consequences will come into effect, and our technological fixes of one problem will produce a raft of new problems.

We can't negotiate with nature

It's an old and tried example, but the classic is the Aswan dam: It produced hydro-electric power and opened farmland, but without the annual flood of the Nile to wash away salts, fields are becoming unusable, Alexandria is sinking, and moreover it's led to a rising water table which is destroying the country's archaeological heritage. Finally, to add insult to injury, it's silting up the topsoil that ordinarily would enrich the floodplain, but which is instead shortening the useful life of the dam. If we continue to see ourselves as over here, and nature as over there, eventually we will pay the consequences.

And this same institutional blindness, I submit, precludes our managing our way out of the environmental crisis. All to often we have regulatory and legislative success stories that are environmental failures, as though environmental problems could be solved by government and lobbyists hashing things out in committee; or as though the environment would meet us half-way if we show a little good will and a gesture in the right direction.

As the record of the past twenty years has made abundantly clear, we can't negotiate with nature. The Clean Air Act has not yet cleaned up our air, the Clean Water Act has not yet cleaned up our water. And for all its encouraging rhetoric, the Bush administration still seems to believe that the way to manage the environmental crisis is to reassure people that something is being done about it rather than doing anything.

Let's take one small but recent and telling example: Rather than push for shrimpers in President Bush's home state of Texas, or one of his home states, to adapt their nets to an excluder device that would guarantee the survival of Kemp's Ridley sea turtles, the administration has promoted a series of compromises and obstructions that will quite likely lead to the extinction of this species. It raises the image of the administration thinking turtles will sort of see the good will and understand that something is trying to be done and will survive and figure out a way to get out of the nets.

But the message is clear, that the way the administration views the world, the extinction of a species that has been around for forty million years is less important than the inconveniencing of a politically vocal constituency. And I might add that the turtle excluder device was invented by a shrimper to save money. It then got gold-plated by NOAA and turned into something dangerous, but the basic principle is sound.

Similarly, while we excoriate Brazil for torching its rainforests, the U.S., as many of you know, lacks the will to stop the clear-cutting of our last stands of virgin temperate forests in the Northwest. The message still seems to be that environmentalism is great elsewhere, and OK at home in small doses, so long as it is not destructive to the bottom line.

I think the large part of our problem is that the seriousness of our fix has not yet penetrated consciousness with the immediacy to force the paradigm shift that will be necessary if the consumer society is to adapt. There's a saying: We do not see things the way they are, we see them the way we are. The fellow who cited this wisdom thought that it came from the Talmud, and it turned out to be a message inside a Chinese fortune cookie.

But the truth of it stands: Our preconceptions obscure reality. People are innately conservative, reluctant to giving up a way of looking at the world. I'm sure some of you know Jerome Bruner, the founder of Gestalt psychology, once did an experiment. He took a deck of cards and salted the deck with anomalies: a red ace of spades or a black queen of diamonds, for instance. When people were shown the deck at high speed, they saw the cards as normal, even though there had been a red ace of spades or a black queen of diamonds. When Bruner flipped through the cards more slowly, people would say —"There's something wrong" —but they were not able to put their finger on the problem. Only with very long exposure, looking at each card for seconds at a time, would people see the anomalous cards and actually see what was in front of their eyes. I think as a society we're at the point at which we can see that there's something wrong with the deck, but we don't know quite what is wrong or what it means.

At the outset, I said that the answer to the question of whether consumer societies can adapt was not so obvious as it seems. Of course consumer societies can adapt. That's what they do. That's their singular genius: The ability to capture the very discontents they produce and turn them into new markets and new sources of profit.

In the book I wrote some years ago called Affluence and Discontent, (and this is not self-advertisement, the book is out of print, it was my worst-seller —you can't get it even if you want it) I argued, among other things, that the tragic irony of consumer society is that it's so well equipped to assimilate change without changing itself that it has lost a critically important faculty of all culture, which is to collectively recognize and adapt to true danger. Thus, by insulating

ourselves from change, our adaptability might be the end of us, providing an aptly ironic twist to the final chapter of the hero myth as applied to modern industrial societies. It doesn't have to be this way.

There are indications throughout the industrial world, for instance, that people recognize that our way of looking at economic activity contributes to our environmental problems. When Keynes helped develop ways of monitoring national accounts, only labor and capital were perceived as scarce, while natural resources were perceived to be unlimited (this was in the 30's) and the environment all absorbed it. Hence, our current economic measures take no account of the long-term environmental and economic cost of agriculture, forestry and industry that is not sustainable. And according to current measures of income flow, the stripping of the world's rainforests shows up as a net plus.

The hubris of the belief that we can manage nature stands to the most well-intentioned environmental professionals

But as Robert Repetto and many others at the World Resource Institute and Theo Paniatto at Harvard point out, the clear-cutting of the Philippines contributed to GNP, but the country now has to import wood, and pays for this policy in terms of erosion, flooding, silted waterways, loss of watershed. A sustainable forestry program, if you can have this, (and the big question is, can you have a sustainable tropical forestry program?) would have yielded the Philippines income in perpetuity. And some countries have begun to recognize this.

West Germany has committed itself to developing more environmentally realistic ways of monitoring economic activity. There's a movement afoot to push the UN Statistical Commission to adjust their measures of national accounts. And, by the way, that opportunity is this current session, and the next time the UN will really review its statistical measures will be in the year 2010, twenty years from now. And I submit that if we don't begin to adjust our measures of economic activity, 2010 will probably be to late. Until our current accounting measures include environmental costs, we'll be locked into our present cycle of making money on the one hand and cleaning up the mess on the other.

One footnote to this: I mentioned the idea of changing national accounts in an article in *Time* this week and got a call from Robert Castan's office arguing that this was now law. Now, how many of you in the audience know that the US has a law to take environmental degradation into account in accounting practices? Well, there's your answer —if it's a law it was discrete to the point of invisibility. It's there in the congressional record, meaning that Senator Castan can distribute it to his constituents. It's a noble and eminently worthwhile effort to come up with a more realistic system

of measuring national accounts and economic activity, but it is not there in any real sense. It's buried in the congressional record.

While American business and government will have to overcome their institutional blindness to environmental problems if we are going to deal with this crisis, I think environmental professionals, your group, will also have to fight parochialism. I think most of you know the law of unintended consequences works for environmentalists as well as technocrats. The hubris of the belief that we can manage nature stands to the most well-intentioned environmental professionals, and conservationists have their own horror stories to tell.

A few years back Australian officials encouraged fishermen to cut up to kill the Crown-of-Thorns starfish which they believed were threatening the Great Barrier Reef by eating coral. What they didn't realize is that if you cut a starfish in half, you've created two starfish, and if you cut it in three pieces, if the pieces are big enough you've created three starfish. So this idea of encouraging fishermen to save the Great Barrier Reef by killing starfish was actually multiplying starfish.

Then they discovered that the starfish proliferation of which they were so worried may be part of a natural cycle, and really has no great impact on the reef to begin with. But had they been right, they would have been agents of the destruction of the Great Barrier Reef.

Those of you who will be working overseas, and I understand that CEIP is starting an international program, will have to fight a tendency to assume that what works here will work there. Some years back I wrote a book, (and again this is not self-advertisement —this one's also out of print) and it was called ***The Alms Race*** and it was about the impact of voluntary aid on Africa. It sought to explain why so many aid and development projects backfired in terms of their effects on the supposed benéficiary. It turned out that if you looked at many of these projects, in terms of how they served the donor's purposes, they were raging successes. The beneficiary was, in essence, irrelevant.

I've been sad to see that the same syndrome affects the new generation of environmental professionals, to some degree. Take, for instance, the Tropical Forest Action Plan; an ambitious, eight billion dollar document calling for aid agencies to put that money into saving the world's remaining rainforests. It was sponsored by the most heavyweight international organizations you could imagine. In its original draft, in '86, it allocated 1.6 billion dollars to go to India, which has almost no tropical forests, and 100 million dollars to go to Indonesia, which has ten per cent of the world's remaining forests. Why? Well, that's the way aid money was going; there was infrastructure to receive the money —that seemed like a logical way to parcel it out. Moreover, the down side of the success stories, some reforestry projects in India that were so disastrous they produced riots. Instead of reforesting and getting fuel to the villagers they

ended up being agribusiness projects for fairly large holders.

In the face of howls from Third World environmentalists, the plan has undergone substantial revision. The problem with it wasn't ill will at all, but rather a document that reflected a world as it appears on pieces of paper read in Washington rather than the world as it is. I was talking to one official from EDF, which is certainly not a soft-hearted organization, highly critical of the plan, and he was telling me that when he first read the plan it made a great deal of sense to him. There's sort of a closed loop in Washington of people talking to each other, and the success stories just got lost in translation, because in some way down the line, they were interpreted as success stories and the riots were forgotten about.

I think the environmental movement would benefit from a little humility, no less than business and the developmental establishment. While the U.S. has environmental expertise to its forte on environmental issues, I would not be surprised to discover that there's a great deal of good environmental wisdom in the Third World that we might import to the U.S. Spencer Bebe of Conservation International pointed out that Peru, for all its problems, has a good system of trying to take national inventory of all its ecosystems —something we've never done.

What can we expect to see in the next ten years? I think nature will continue to insist that we acknowledge that we are part of the natural order, and then we will see a steep escalation of economic dislocations and health problems that result from man's assault on various ecosystems. Coupled with such problems as the social disintegration of our inner cities, I expect the scale of our problems will produce a great deal of experimentation, a sort of gradated period of adaptation and confusion, not to mention the search for villains.

Although a shift in consumer values would pose a challenge for American business, I think the alternative is much more grim: A populace that habituates itself to an ever more polluted and inhospitable world. One only has to look at Mexico City, Cairo, Rio and dozens of other places drowning in their own industrial and human waste to see that people can adjust to almost anything if they see no alternative.

Given the problems that face us, and the imagination and resources it will require to try and cope with them, I can't help but wonder how people like Francis Fukuyama could argue that the end of the Cold War means that we are entering a boring period with no great issues to debate. We should only be so lucky. Thanks very much.

Questions and Answers

Q *What do you mean by "new consumer" or "new economic paradigm?"*
Actually, it leads into an endless well of discussion, but in my view, one of the defining attributes of consumer society is that it basically translates discontent —almost a religious discontent —into a material appetite. The satisfaction of the material appetite extends the hegemony of the consumer society. That's a very arcane way of putting it.

Nature will continue to insist that we acknowledge that we are part of the natural order

I think that the consumer society has been a long evolving system. Evidence can be found even in interest in backpacking or cross-country skiing —this back to nature movement, where the way you relate to nature doesn't have to be assisted by high technology. Change in the consumer society comes from the changing view of our role in the world, the changing values. If the only way to find happiness and achieve identity is to spend money and acquire material goods and conveniences —if that continues —it's an unsustainable thing, if scaled up.

I should point out that the world can deal with almost anything if the scale is right. In Malaysia, where I was not to long ago, there's a tribe. Members of the tribe, who lived in perfect harmony with the forest, would occasionally cut down a tree if they saw a fruit they wanted. A clearly unsustainable thing to do. An anthropologist pointed out: Why not climb up the tree and get the fruit, even if it would be difficult in this case, and then you'd have the tree for other fruits? and they said: Oh, there's no way we could hurt this forest —It's too big.

This is a group of people who've really lived in harmony with the forest but you can see that if their attitudes were scaled up they would not be sustainable. Similarly, I don't think that consumer behavior, in small doses, is unsustainable. It's always a question of scale. And that's why the numbers problem is probably at the heart of most of our environmental problems.

Q *How can you interpret environmental issues into financial accounts?*
Repetto uses the example of a typical manufacturing plant. What are the health costs that will result from its effluence? What are the long-term and short-term costs and how can those be integrated into the costing of a particular manufacturing enterprise? We measure health costs of pollutants at the moment. We give a figure to them, I don't know how accurate those figures are. Example: X pollutant is estimated on an actuarial basis as costing us eight billion dollars a year. So there's probably a way of apportioning it. I think the ethics to start clean rather than clean up is the major wisdom of the last twenty years, meaning that, instead of saying "Manufacture dirty and we'll clean it up later," through laws, let's create a series of

incentives and handle these so that everything militates towards manufacturing clean in the first place. And a system of accounting like one Repetto is talking about will be introduced best in a staged way anyway, taking the easy hits, and then trying to deal with the more complex problems.

Q *Do you think manufacturers should be able to trade pollution rights in the system proposed?*

In that such trades would at least make pollution as a cost visible, I think it's a useful step, but I don't think it's a long-term solution.

Q *What about the notion of capping pollutants?*

This gets back to the notion of trading with nature. We really don't know how any one ecosystem works. Even a simple stream system is an enormously complex system to understand. That kind of capping of pollutants presumes that we know enough about these systems to manage them.

Fisheries management is nowhere after all these years and after hundreds of millions upon billions of dollars put in by countries to try and understand fisheries, we still don't understand the dynamics of the Georges Bank, for instance, and what actually causes fluctuation in fish population. So this presumption that we know enough to manage these systems and put caps on what is going to effect them —it contains an assumption that is part of the problem. The attitude is to do the least that you can to that system, not try to find out what's the most you can do and trade that back.

Q *Do you have a vision of what the First World should be saying to the Third World about development.*

Funny you should ask. That was the basis of a piece I did this week. There are two things: First, I think that the First World has to get its act together to speak at all on these issues to the Third World because we've been giving mixed signals for a long time. We send out one set of agents that say "Build the Mappowaley dam," then another set of the same nationality and the same country, sometimes also from across the street from the other set of experts, come out and say "This dam is a disaster and it's leading to the destruction of your tea plantations and fisheries and tropical forests." One thing we have to do right at the start is to try and get some coordination into the public signals that the industrial world sends out to the Third World. Because what we do now is send contradictory signals. Quite justifiably, in many of these countries people are quite confused because no sooner have they begun to implement a plan, pouring money into a project, than they begin to hear that this project is a disaster.

Q *The issue that I was trying to address, is how can you tell China: "Not everybody in your country should have a refrigerator"?*

I don't think you say that to China. What you try to do is improve and deal with problems. Presumably, there's the wisdom in the Third World to decide what is wasteful and what is not. Quite a large part of the problem is that it's fun to sell refrigerators to China because it's good for the bottom line, and that's one reason that many of these countries have these wants.

I was riding in the plane yesterday next to a woman who was in the Peace Corps in Kenya, and her husband was engaged in a water project that was funded by CRS (Catholic Relief Services) which is not a bad organization. This is fifteen years after I wrote ***The Alms Race*** about this very problem: The key thing to the project was selling Dutch pumps at ten thousand dollars a pop in Africa.

He designed a pump that the Africans could build themselves which was a pretty simple pump, also figuring that this would create a local industry that serviced the pumps and maintained them so that the money would stay there. In consequence he was fired. One thing we can do is not so much saying —"Don't own refrigerators." If we stop seeing aid and development as a way of moving our own technology it would help a large measure of the problem.

I think that at the top of the list in development is family planning —overpopulation. In Africa, birth rates of the labor force outstrip any conceivable models for increasing GNP and, in fact, GNP has been stagnant to negative in much of sub-Saharan Africa for six to eight years. It's absurd to consider development in isolation from family planning.

There's one ray of hope in the population numbers. I did a story on "Torching the Amazon." While I was down there, there was some controversy over whether the birth rate had dropped. You have to understand that in Brazil there's zero attempt to promote family planning in any way, shape or form. Also, all the projections held that there wouldn't be any increase.

The conventional wisdom in family planning is that only with a dramatic lowering of the infant mortality rate for a generation or more will people then begin to lower the birth rate. The interesting thing in Brazil is that there really hasn't been that dramatic a lowering of the infant mortality rate and in parts of Brazil it has actually risen, but the birth rate has dropped. There was a debate on this in June and then a couple of months later to settle it —it has dropped dramatically.

People have come to the conclusion that the seven or eight children that they saw as a type of security is actually a type of impoverishment —or apparently so. The fact that this happened without any outside help whatsoever in areas where there's very little access to either information or birth control devices, I think, is very heartening. It shows that there is a sort of innate wisdom in

people when they can see the consequences of a particular path and they adapt.

Q *What do you think of organizations such as WorldWatch and what they're doing?*

I think WorldWatch provides an invaluable service as an alarm system. Most of the major environmental groups and think tanks have cried wolf at one point or another. I think there's a tremendous danger to crying wolf, because of the loss of credibility. For instance, I think the spotted owl was the wrong issue to try and stop the clear cutting of some Western forests. The spotted owl is likely not to go extinct if those forests are cut. What happens is that you end up damaging yourself and your case.

I think WorldWatch in the past has occasionally cried wolf, but I know Lester Brown, and I know that he has made tremendous efforts not to be irresponsible in terms of the kinds of statements he makes. That book is a best-seller, their State of the World report they put out every year. It shows that there's a tremendous hunger for that kind of information.

In fact, everybody's flying blind on these things, because we don't understand the systems and then we don't understand the consequences of given actions; and because the future is not ever a straight line prediction of the past —the future is always revolutionary in one way or another. You make predictions on a straight line basis and you're always going to be wrong.

From Moon Suits to Three-Piece Suits: Careers in Hazardous Waste Management and Reduction

- Harry Fatkin, Director of Health, Safety, and Environmental Affairs, Polaroid Corporation
- Marjorie Alt, Toxics Program Director, MassPIRG (Public Interest Research Group)
- Dr. Robert B. Pojasek, President, ChemCycle Corporation

Editor's Note

The hazardous waste field has traditionally been thought of as a place for those with technical backgrounds. In this session, however, it was interesting to note that communicative, administrative and organizational skills were much desired attributes. This was particularly true for advocacy work in the nonprofit sector, but was also true for jobs within industry. All three panelists claimed that commitment, enthusiasm and a specific focus can often overcome certain deficiencies in one's scientific background. However, this field is heavily dominated by those with technical skills and this is still where most of the opportunities are to be found.

Harry Fatkin

Mr. Fatkin began his presentation by describing the Polaroid company and the organization of its staff in the environmental area. As a $1.86 billion dollar company with over 12,000 employees, Polaroid has been at the forefront of addressing environmental issues. In 1975, prior to TSCA and RCRA—a time when "community issues were sleeping," Polaroid established its Office of Health, Safety, and the Environment. Today, forty staff perform the functions of this office. Through Polaroid's matrix management, the corporate members of this group, including three safety professionals and three industrial hygienists, interface regularly with the staff at the firm's factories.

Mr. Fatkin is responsible for policy development, program development, and program implementation. In developing corporate

policy, Mr. Fatkin works with internal and external groups. Internal groups include Polaroid committees such as the corporate steering committee on health, safety and environment on which the Polaroid CEO participates regularly. External organizations include groups such as the Massachusetts Public Interest Research Group (MassPIRG). In the development and implementation of programs, Mr. Fatkin added that Polaroid managers are generally receptive to dealing with environmental issues. However, Mr. Fatkin also noted that an important function of his job is to coach the managers in achieving their objectives.

For many environmental staff, this need to "influence up" the chain of command is frustrating. To alleviate this problem and better facilitate communication between management and environmental staff, Polaroid recently held "Polaroid Earth Day." About 150 Polaroid staff attended and discussed their facilities' five year program for toxics use and waste reduction.

Mr. Fatkin provided a profile of the thirty personnel who do environmental work at Polaroid. Their backgrounds are dominated by chemical engineering and other science or engineering degrees. A sampling of fifteen is as follows: eight chemical engineers, five other various BS degrees, two other degrees.

Of these, two received their degrees in the 1950's, four in the 1960's, seven in the 1970's, and two in the 1980's. He noted that ten staff have been doing environmental work for less than three years and three greater than ten years — a reflection of Polaroid's recent restructuring.

Since Polaroid is a high technology company, it tends to seek and attract more staff with strong science or engineering backgrounds. However, Mr. Fatkin noted that enthusiasm and interest in an area important to the company can compensate for deficiencies in a candidate's background.

Marjorie Alt

Ms. Alt related the history of MassPIRG as an organization which originally worked on consumer protection issues, but has increasingly focused on environmental issues. Currently, MassPIRG has 80 staff, 30 of which work on toxics issues. The staff work to field input from the public regarding what they see as problems and sift through the problems to identify major issues. The major part of MassPIRG's effort is concentrated in developing and implementing comprehensive policies for dealing with these issues.

MassPIRG staff generally do not have much technical expertise. Instead, they are adept at advocacy, i.e., organizing public and political forces to achieve a goal. Ms. Alt gave the example of MassPIRG's Toxics Use Reduction campaign. The issue was an easy one to sell to the public, but the public and politicians were uneducated as to implementation techniques. By facilitating communication among industry representatives, politicians, and the public,

MassPIRG bridged the education gap and built consensus regarding appropriate solutions. The MassPIRG effort included raising money (99.9% of MassPIRG's funding comes from individual contributions) and "working the political scene."

MassPIRG staff have many options when first starting out, from writing papers to networking with communities. Individuals interested in working for MassPIRG need only have concern and commitment to issues, not extraordinary skills. Some experience in political activism is desirable (e.g., working on a political campaign, managing an environmental club), but the specific area of involvement is not important.

In closing, Ms. Alt noted her regret at hearing many apologize for sounding idealistic in their statement of career goals. She encourages this idealism and points to organizations such as MassPIRG as a good way to pursue one's ideals.

Robert Pojasek

Dr. Pojasek described ChemCycle as a three year old environmental consulting firm with a staff of twenty five people and fees totalling about three million dollars annually. ChemCycle has done work in thirty eight states and six foreign countries. In general, ChemCycle focuses their consulting activities on assisting industries in managing the use of chemicals. Recently, ChemCycle has performed a number of "due diligence" audits and site investigations associated with leveraged buyouts. The large number of corporate buyouts has also meant restructuring and reduction of companies' environmental staffs. Environmental consulting firms such as ChemCycle are sometimes asked to perform functions that supplement a company's existing staff.

Dr. Pojasek described the private consulting business as demanding. Many projects have "short fuses" and require the commitment of long hours or a lot of traveling — Dr. Pojasek himself has traveled to forty four states and fourteen countries. In addition, the nature of consulting is such that you have to write proposals to pursue additional business when you are busiest. Another characteristic of consulting is that it is unpredictable; you can never be sure what you might be called upon to do each day.

To pursue a career in consulting, Dr. Pojasek said that a strong background in science or engineering is important. It is also desirable to have a good background in chemistry. However, Dr. Pojasek emphasized that beyond having a good technical background, consultants need to be good communicators with strong writing and speaking skills. He pointed to the fact that consulting is a "service business" and that the "perceptions of clients are critical." He said that consulting is analogous to waiting on tables; waiters and waitresses who get good tips are the ones who are able to communicate with and satisfy the needs of their customers.

Questions and Answers:

Q *Is it possible to find work in companies such as Polaroid or ChemCycle if you are not an engineer?*

Mr. Fatkin said that since Polaroid is a "high tech" company it tends to attract engineers. But he stated that in the past two years, Polaroid has been holding regular community meetings as part of its compliance with federal "Right To Know" regulations (governing chemicals in the work place) and that it has employed non-technical, community specialists to support these efforts.

Dr. Pojasek added that what is important is the ability to "ask good questions" that truly address a client's concerns — a skill that does not necessarily come along with a technical degree.

Q *Is it necessary to have an advanced degree?*

Dr. Pojasek stated that most consulting firms look for individuals with advanced degrees because it boosts their company's qualifications and reputation in the eyes of perspective clients.

Mr. Fatkin added that individuals planning to pursue a position having only a bachelor's degree should strive to show some knowledge and enthusiasm for the business — something that will set them apart from other candidates who may have advanced degrees. Both Mr. Fatkin and Dr. Pojasek stated that their companies offer financial assistance to current employees for advanced coursework if their area of study is directly relevant to their jobs.

Q *In pursuing a position with a corporation, I would like to be able to know in advance if the company is environmentally responsible and progressive. How can I find out?*

Dr. Pojasek said one can contact organizations like MassPIRG or obtain information from the Franklin Research Group, which has compiled statistics by which potential investors can evaluate how environmentally responsible companies are. Mr. Fatkin added that it may also be worthwhile to identify companies who are involved in addressing public issues.

Q *Is it possible to promote conservation to industry by emphasizing the cost savings that could result from waste minimization (i.e., better use of raw materials, less potential for costly fines, etc.)?*

Dr. Pojasek said that this is generally a "hard sell." The cost savings are usually not great enough to significantly affect the company's bottom line. Industries are more motivated by a desire to "do the right thing" and keep their corporate images untarnished.

Q *Small industries can often not afford a consulting firm's fees. Where can they find help in solving their problems?*

Ms. Alt said there are state environmental departments and trade associations which exist to help such companies. Dr. Pojasek added that some large industries, such as Dow Chemical, provide help, although sometimes with an ulterior motive (such as selling the smaller company a specific chemical product or piece of equipment that the larger company manufactures). ■

Submitted by Martha Monserrate, CH2M HILL, Inc.

Trash and Cash: Careers in Solid Waste Management and Recycling

- Robin Ingerthon, Co-Director, Earthworm.
- Norman Willard, Executive Director, NEWMOA (New England Waste Management Official's Association)
- Patricia Daley, Waste Management Coordinator, Cape Cod Planning and Economic Development Commission

Editor's Note

All three speakers for this session stressed the importance of gaining hands-on experience in this field before trying to land one's first permanent job. They also emphasized the usefulness of a technical background and the advantages of understanding the entire recycling process from collection to recycling to manufacturing and selling new products. Accordingly, as the field grows there will be a greater need for personnel with sales and marketing skills. Finally, all the speakers stressed that this field will continue to become more important and that it has great potential for entrepreneurs and people with innovative ideas.

Robin Ingerthon

Mr. Ingerthon started his presentation by briefly describing his background. He explained how he received an MBA which helped him to better understand the economics of recycling. He especially stressed the selling of recycled goods as an area where there was still much work to be done.

Mr. Ingerthon went on to explain that the easiest way to get involved in this field is to become an expert on the material. To this extent an engineering degree can be useful. However, he also claimed that many waste management firms need marketing departments. Because of the lack of marketing expertise there is a consequent need for consultants. He related this to his experience with the University of Massachusetts where he worked as a consultant helping to set up a recycling program.

He stressed that when contemplating the waste management field it was important to consider the entire manufacturing process. In this light, he explained that hands-on experience is very helpful. He concluded by explaining that the easiest way to find solid waste and

recycling firms is to look up scrap or waste paper in the Yellow Pages.

Norman Willard

Mr. Willard started his presentation by stating that he had been in the environmental field for sixteen years. In college he was an English Literature major. He continued on to law school during which time he had internships with the US Attorney's office, the Massachusetts Department of Environmental Quality Engineering, and the US EPA Region One. After law school he went to work as a counsel for the New York State Department of Conservation in Albany. He worked primarily on air, water and waste issues. He provided advice and collaborated with scientists developing legislative regulatory agendas. He also worked closely with the state government, lobbyists, and the Attorney General.

After New York, Mr. Willard continued to Boston where he worked as an in house consultant developing priorities for the regional office of the US EPA. The work was exciting and he came in contact with a large variety of groups.

Three years ago NEWMOA was formed so that the Northeast waste management officials could have clout at the federal level. One aspect of the position has been the formulation of technical work groups which design integrated solid waste plans, landfill design. Mr. Willard believes that it is important to get both NEWMOA and the general public more concerned with source reduction. He is confident, however, that Congress will be putting more money into both solid waste management and source reduction. This means there will be opportunities in education and traditional engineering as well as the environmental sciences.

Finally, Mr. Willard recommends that in starting a career it is important to try different areas. One of the easiest ways to do this is to volunteer.

Patricia Daley

Ms. Daley started her presentation by describing her career path. She explained that attending the Vermont Law School was helpful in starting her environmental career because they have an environmental law center. Ms. Daley mixed her educational experience with internships so she could gain hands on experience before she started her career. She worked with MassPIRG on the Bottle Bill and she also interned with the Metro District Commission on watershed management. She now works for Barnstable County which covers fifteen different towns.

Ms. Daley went on to discuss how diverse her job can be. The solid waste field can be very interdisciplinary, one has to work with laws and regulations at the local, state and federal level, public education and local outreach. It is also a good asset to have a scientific grounding; an engineering degree would help in understanding

how solid waste can affect ground water. Many careers in solid waste can be very high profile because it is such a publicized issue.

Ms. Daley provides towns with technical assistance. She also helps them to prepare grant proposals. She does long range planning, siting recycling and household hazardous waste facilities. Rural communities need to set up stable markets for these facilities. This calls for regionalization. Massachusetts must put forth regulations that would allow two to three permanent hazardous waste sites. There can be no more landfills on the Cape, which is the only place in the state that relies on a single aquifer for its water. For the planning part of her job she states that micro and macro economics and statistics are very helpful.

Questions and Answers

Q *Who makes sure that there will be a market for a recycling plant?*

On the one hand cities and towns are often held responsible with suppling a facility with waste. On the other hand it is up to the facility to make sure that there is a buyer for the recycled product. The government needs to establish incentives for buying recycled products and industries need to produce more easily recycled goods.

Q *Does the availability of incinerators hurt recycling?*

Ms. Daley responds that there is a role for burning, however, we need to establish an integrated approach. Fourteen of the fifteen Cape towns are burning at SeaMass. At twenty one dollars a ton it is a disincentive to recycle. If you add transportation costs and travel distance, prices can reach as high as forty dollars a ton. Therefore we might be able to convince communities to recycle using economic arguments.

Q *What sort of a role will a grass roots organization play?*

There is much work that has to be done at the grass roots level. Not only do we have to educate the public in order for them to buy the right products but we also have to create the attitude that waste must be taken out of the cycle. Grass roots groups will also be effective in influencing legislators.

Q *What about plastics?*

Many people do not realize that there is great potential for recycling plastics. Industrial plastics can often be recycled into the same material, it usually sells for about three hundred dollars a ton. Mixed consumer plastics, such as fiberfill and umbar must be made into larger items.

Q *What about wood waste and demolition debris?*

There is a plan in Boston to build a commercial MRF to handle debris from demolitions. One problem, however, is that transportation costs are very high. ■

Conference Note Taker: Laura Gilbert

"Trust Me": Careers in Land Use and Preservation

- Katharine Preston, Executive Director, 1000 Friends of Massachusetts
- Warren Flint, Jr., Principal, Matlock Associates
- Marty Zeller, Vice President, Vermont Land Trust
- Kingsbury Browne, Esq., Senior Partner, Hill & Barlowe

Editor's Note

All of the panelists expressed the importance of a long-term commitment to the land preservation field and stressed the small but growing number of career-level job openings now available. Although graduate level training is a prerequisite to entering this field, all stressed the importance of having a broad, liberal arts background as a means of understanding the range of issues addressed. Graduate work in areas such as law, engineering, landscape architecture, business, and resource management were highlighted as being helpful to a career in this field. Internship and volunteer programs were recommended as additional ways to obtain experience in this field.

Katharine Preston

Ms. Preston began by stating that work experience in both the private and public sectors, and thus understanding how both sectors operate, is important in the field of land use planning and preservation. Having experience with private non-profit organizations is also important she added, for it is through these organizations that many new initiatives in land use planning and preservation are now being carried out.

Ms. Preston stressed that "land use planning is not just preservation." Although preservation is one important aspect, she mentioned that land use planning encompasses many diverse disciplines such as natural resources planning, building regulation, municipal planning, and public policy. She also stressed that a position in the field of land use is "not a nine to five job," as most positions involve much work with volunteers which occurs at night or on weekends.

As the executive director of a small, non-profit organization, Ms. Preston described how varied her day-to-day activities were, from lobbying members of the state legislature to buying office supplies to drafting position papers. Stating that the most gratifying aspect of

her work was being listened to, she noted that the most frustrating aspect was "not being listened to when you know you are right."

In addressing whether graduate level work was needed for a career in land use planning and preservation, Ms. Preston recommended that graduate work was in fact necessary for such a career and that it should have a specific focus, such as planning, landscape architecture, natural resource management, or a related environmental field. She also recommended that having an unspecialized, "exploratory" undergraduate background was important in developing a broad-based understanding of the field. For college graduates wishing to begin a career in land use planning prior to going to graduate school, Ms. Preston suggested internship programs and volunteer positions as ways to gain experience in the field.

Ms. Preston also suggested the following five points for beginning a successful career in the land use planning and preservation field:

(1) "Do enough academic work so that you can talk with the experts. That is, develop a good environmental background and good communications skills so that you can discuss anything with anyone."

(2) "Do consider spending some time in the government sector. This is important for understanding how the government works, the problems it faces, and the power of policymaking."

(3) "Learn to accept that those aspects of having an environmental career that attracted you the most (e.g., being outdoors) will decrease inversely with your position and your power."

(4) "Don't assume that the highest paying jobs are the most influential. Success in this field must be measured on a different scale — and many different types of opportunities await."

(5) "Take your inspiration for the uphill battle from some of the great ones, such as Aldo Leopold's ***A Sand Country Almanac***, Henry David Thoreau's ***Walden***, Loren Eisley's ***The Immense Journey***, Annie Dillard's ***Pilgrim at Tinker Creek***, John McPhee's ***Encounters with the Archdruid***, Edward Abbey's ***Desert Solitaire***, and Bill McKibben's ***The End of Nature***."

Warren Flint, Jr.

Mr. Flint began by stating that he "backed into" the field of land use planning and conservation. Although he began his career as a traditional landscape architect, his current conservation land planning work grew out of his preference to work with conservation groups and not with developers. His firm, comprised of five people, works with non-profit organizations, governmental entities, and private landowners throughout New England toward the goal of land preservation.

Mr. Flint stated that the most gratifying aspect of his work was "working with land owners in developing the future for the land, with preservation as a goal." Whether the proposed parcel for

preservation is four or 3200 acres in size, he described the main steps his firm uses in land preservation planning. These steps include mapping the land's features, analyzing the physical limits of development on the land, identifying the land's features which should be protected, and developing a list of options to achieve preservation goals. Such options for preservation often include the imposition of conservation or agricultural restrictions, the purchase of the land's development rights, and the outright purchase of the land into preservation.

As for the skills required to work in a firm such as his, Mr. Flint listed a range of skills including mapping and cartography skills, wetland and other resource identification skills, soil analysis skills, site analysis skills, knowledge of environmental laws and regulations, familiarity with zoning restrictions and subdivision design, appraisal skills, and familiarity with relevant gift and estate tax laws. In order to develop these and related skills, he suggested professional training in the fields of engineering, law, land use planning, and landscape architecture.

Marty Zeller

In describing his experience with Colorado Open Lands and with the Vermont Land Trust, Mr. Zeller explained what it is like to be in the land trust profession. With more than 800 land trust organizations in the U.S. (at the local, statewide, and national levels), he stated that "to be a land trust professional has become an increasingly complex occupation." However, in spite of this complexity, he commented that a diversity of backgrounds is needed within each organization in order to address the wide range of issues that arises with each land preservation project.

Mr. Zeller stated that "the land preservation process is project-specific, with each project being tailored to result in a desired outcome." To reach the desired result, he said that meetings and negotiations with many people are required to first identify and reach consensus on preservation goals. Such negotiations are often quite time-consuming, with the typical project requiring three to four years from start to finish. Mr. Zeller commented, "Although we are a mission-oriented group, we are deal makers and not purists. We often have to take sides with former adversaries and compromise in order to reach our goal." While he stated that it was satisfying to see land being preserved, the slow process required was frustrating since "we can't get enough accomplished fast enough."

Regarding the types of training required to enter the land trust profession, Mr. Zeller commented that no specific curriculum is now required. He did recommend the following fields as good sources of needed skills: communications, real estate, economics, finance, business, planning, and design. As for positions in the field that are available to college under- graduates, he also felt that such positions were limited to internships and volunteer programs, with most

career-level positions requiring some type of graduate work.

Mr. Zeller offered the following suggestions for those interested in becoming land trust professionals:

(1) "The goal of land preservation must be important to you to be in this field."

(2) "Look for mentors — people you respect — in your organization to work for. Finding the right people is very important."

(3) "There is and will continue to be a growing need for competent people from all disciplines in the land trust profession."

Kingsbury Browne

After describing his career as a traditional tax lawyer in Boston, Mr. Browne explained how he became involved with land trust issues during a sabbatical at the Lincoln Institute for Land Policy. He related how his research concerning the land trust movement in the U.S. resulted in the establishment of the Land Trust Exchange, an umbrella organization now supported by nearly 400 land trust groups. He also described how new laws and policies now incorporate land trust provisions into income and estate tax provisions.

Mr. Browne discussed the role a lawyer plays in the establishment of land trusts. In addition to being a tax expert, he stated that his role has included being an expert in the field of estate planning as well as that of land preservation. Good litigation skills are also necessary. As for a particular approach that a college graduate interested in law and land preservation should take, Mr. Browne recommended obtaining a traditional law school education first and then specializing in land preservation matters by working at a law firm or with a land trust organization.

Questions and Answers

Q *Are any positions available with private corporations in land use and preservation?*

Preston: There are many corporations that are aware of and interested in land preservation issues. For example, businesses are often concerned with the implications of siting a large facility in a certain area and with housing/quality of life issues facing their employees. However, since none of us has worked for a private corporation, it is difficult to answer the question more specifically.

Zeller: Land trust organizations cannot survive without corporate involvement. For example, many land trusts have corporate members on their boards of directors. This relationship between corporations and land trusts is beneficial to both sides, as many corporate decisions involve land use and preservation issues.

Q *Would you recommend working at a planning firm prior to going to graduate school?*

All of the panelists agreed that working in a planning firm (or with a government planning agency) was a good way to acquire and

to develop skills needed in the land preservation process. It was also agreed that good communication skills were as important as good planning skills.

Q *Do most land trust organizations have lawyers on their staffs?*

Zeller: Whether a land trust organization has an in-house lawyer normally depends on the size of that organization. For example, due to our large size as well as the high volume of conservation restrictions that our organization must oversee, we now have one full-time in-house counsel. In Colorado, our organization was smaller and we primarily used outside counsel on a pro bono basis for real estate transactions and estate work. ■

Conference Note Taker: Cynthia Carlson Beckham

The Human Habitat: Jobs in Housing and Community Development

- Gregg Ramm, Assistant Director, Institute for Community Economics
- Sheila Kennedy, Consultant, City of Boston
- Philip R. Giffee, Executive Director, Neighborhood of Affordable Housing

Editor's Note

Although a graduate degree can be helpful for later advancement, it was generally agreed that experience is more important when first starting your career in this field. It should also be remembered that this is not a field traditionally associated with environmental protection. However, this is changing as people begin to realize the importance of issues such as affordable housing, growth management and a number of other urban environmental issues. The "urban environment" is a concept that is just beginning to come into its own. All three speakers were hopeful that community development would continue to be an expanding field.

Philip Giffee

Philip Giffee began by describing his career history. After several years of working in planning related jobs, community organizations and political campaigns, someone told Mr. Giffee to "hire yourself an employer", which made an impression on him. Being from the East Boston area, he knew that the neighborhood needed another Community Development Corporation which would prove to be more multicultural as the needs of the area had changed. And so he started NOAH, which now has 5 employees, one of whom is the environmental coordinator.

He then described a normal work day which includes: talking with carpenters, funders, property owners, realtors, requesting rehabilitation licenses, writing checks, etc.

About the work in general, he noted that goals are important, and that housing development takes time and can be very frustrating. He listed the following advantages: you're meeting a human need,

you meet fine people, you are a social entrepreneur, and you can shape a community.

The disadvantages are: the funding cycle of the government (city, state, federal) creates a great deal of uncertainty. There is a lack of a constant source of funds. You can't always produce as much as you would like.

About the types of jobs available, he said that a graduate degree is a requirement and one should try to get an internship. There is a need for numbers, policy or program analysis. There is a need to bring expertise into the field and a need for affordable housing. Large firms offer less community development work and there is also the Boston Re-Development Authority. Property management is also a growing field.

In sum, he suggests those who want to get into the field should: go to graduate school, get decent grades, do an internship, get good recommendations, believe in what you do and respect others.

Qualities he looks for are: analytical skills, the ability to read a budget, negotiating skills, knowledge of architecture and familiarity with LOTUS.

Gregg Ramm

Mr. Ramm began by introducing his organization which provides technical assistance financing throughout the country for affordable housing. The organization advocates the Community Land Trusts Model which encourages separate ownership of land and natural resources from ownership of housing. His professional history included an undergraduate computer science degree and working for The Peace Corps in Zaire where he taught Physics and Math. This was an extremely eye-opening and formative experience as he realized that poverty was a wide spread condition and that the role of the US is important in affecting these conditions.

Upon return from Africa, he met the director of ICE. He had few skills but was hired for one month to do computer consulting and needs assessment. He agreed to the job on the condition that he would be considered for a staff job. He was hired after his consultancy. Since then, he has filled a number of different roles for ICE. Now, he handles internal management for a staff of 25.

Referring to the nature of the work, he is constantly struck by the enormity of the housing and homeless problem, and noted that there is a challenge on how hard one can work because it could easily be 24 hours a day. Non-profit work can be demanding by its long hours, but there is flexibility; professional behavior is always expected.

There are three broad categories of jobs in the field:

1. Service: which includes working in kitchens, shelters, and meeting human needs. They are valuable organizations.

2. Development: This could include housing development, management, structure development, financing concerns, city and

state government work, etc.

3. Policy Advocacy: the need for which stems from the realization that as much as individual housing is built, non-profit housing is not the answer. Advocacy work is needed to try to change existing structures and come up with a viable alternative.

A major problem in housing is not a lack of money but the structure of ownership. Money flows into a neighborhood but because of absentee landlords, the money flows out.
ICE supports projects which foster community control and ownership. Governments often subsidize for-profit developers or privately owned housing projects by giving low-interest mortgages. When the 20 year restrictions on affordability expire, the low-income housing has tremendous value and the developer will often make the most of the situation at the expense of the tenants. ICE tries to provide affordability. ICE works in three integrated areas which can generally be categorized as community development. They are: Personal/practical/political.

Personal level: provide compensation based on need.

Practical: work with groups developing units of housing.

Political: the practical is base for larger political advocacy work.

While still in college, he recommended that students get involved. They look for either service work or organizing experience.

Qualities he looks for are organizing experience, overall common sense, communication skills which are important to be able to work with diverse constituents, hard workers who will not be put off by stuffing envelopes occasionally, belief in the work for the notion of justice, not charity, and complimentary political and personal aspirations.

Sheila Kennedy

Ms. Kennedy began by saying that it is innovative that the directors of this environmental conference have included housing as housing is often viewed as an opponent of the environment.

She then mentioned a current controversial project which is attempting to put affordable housing near Walden Pond, and talked of the discontented Concord neighbors. She stressed that we need to get rid of the mindset which encompasses bad feelings about affordable housing.

She mentioned a project that is a good example of the kind of innovative ideas needed in this field. She is currently working on a project where a church donated land, and a developer agreed not to take a profit in order to build starter homes for homeless women and families. The housing field has been very exciting since World War II, but now there is a need for a new thought process, she argued. There is a need for something different from the federal level.

The current problems she outlined are that the first time home buyer can not buy a home. Homelessness is unprecedented in

America right now. There is a real need for community-oriented elderly housing. The government is pumping 30 billion dollars into nursing homes and 20-40% of it would not be needed if services had been connected to housing. It is no accident that the highest priced houses have the best services: transportation, shopping, health care. Developers get amnesia when designing for those who don't have money to spend.

The government is integrally involved in all housing; public or private. With private housing, investors get a bigger subsidy than those in public housing: an interest write-off on home mortgages. Private housing therefore has far more government assistance.

Ms. Kennedy ended her presentation with a summation of the issues that are most important today. At the community level, existing stock of houses are important because new construction is too expensive. Lead paint is a big issue...over 60% in Massachusetts and 80% in Boston still have lead paint. Landlords are small and have little capacity to de-lead. The service community is incredibly important. Elderly housing, day care and support services are needed. Housing management has been forgotten. Building management is going to be important. There are few if any management courses in the Boston area. Practical aspects of management are needed.

She finished with one final piece of advice. Internships, whether for academic credit or purely for the experience, are a great asset.

Questions and Answers

Q *What area should one focus on in graduate school?*

Ms. Kennedy said that many schools have core curriculum in planning and you can change your mind easily. She suggested essential courses: History of Urban Planning, Statistics, Real Estate Finance, Community Development and Housing Management. She also suggested beginning with night courses such as those offered by Northeastern.

Mr. Ramm didn't emphasize grad programs. Get involved, he stressed. But he mentioned the New Hampshire College Community Development Program on the weekends for practitioners. Also, work first...grad schools look at experience before they accept you.
Question: What are some of the best ways to get involved?

Ms. Kennedy claimed that "state representatives and city counsellors need help, but may not be able to pay. You can work there or ask what the organizations are that work in the area."

Q *Do communities approach you as a community development corporation?*

Mr. Ramm explained that "ICE is national so we get requested from all over the nation; all of which we can not respond to."

Q *How do you develop affordable housing without subsidies?*

Ms. Kennedy replied, "it is very difficult. The market has turned in Boston and market rate projects are going under. Not one of the public facilities department projects have gone under." ■

Conference Note Taker: Elizabeth Schueler

Pure & Simple: Jobs Related to Water Issues

- Ivan C. James II, Chief, New England District, Water Resources Division, US Geological Survey
- James Monroe, Executive Director, Charles River Watershed Association
- Judith Wagner, Coordinator, Riverways Program, Massachusetts Department of Fisheries, Wildlife, and Environmental Law Enforcement

Editor's Note

This panel was particularly interesting because all three speakers work on similar issues yet have different responsibilities and consequently different training. Mr. James has focused on hard sciences most of his career while Mr. Monroe concentrated on public policy as the best way to achieve his goals. Finally, Ms. Wagner originally focused on education, yet as her career evolved into the environmental field, she found that her educational experience was a useful asset for her current job. When considering your training, all three stressed the importance of thinking about the type of organization in which you would eventually like to work. E.g. developing technical skills to work for an agency like USGS, or organizational and communicative skills and working for a nonprofit.

Ivan James

Mr. James began his presentation by describing what his agency does. The Geological Survey is a scientific agency with three main operating divisions: mapping, geology, and water resources. The water resources division, which Mr. James is in, does data collection, analysis, scientific research and investigative or aerial type studies, which might be involved with acid rain or surface water supply issues. As a scientific agency, USGS tries to evaluate objectively. The agency does a lot of work with states and other federal agencies who are interested in environmental questions. He claims, "we have no axe to grind pro or anti development."

Mr. James' current work can be considered management of a field program. "Our people" go into the field for a two or three year project, e.g. evaluation of acid rain or potential river sources. The project chief will produce a report describing the activity and the

interpretations and conclusions. Most everyone in the agency goes through this process at one time or another. "If you're good at it and enjoy it, you may stay with it, or, as I have done, switch to a management track," he explains.

People hired by USGS have very strong physical science backgrounds and a lot of mathematics. They hire 30-40% at bachelors level, 10-15% at Ph.D. level and the rest at Masters. They would hire more Ph.D.s but don't find them available for this type of work. Mr. James concludes, "the advice I would give, if you're looking for a career in science, stress science and mathematics in your education. Also be computer literate, which I assume is not an issue with you all, but was certainly not traditional when I went through the educational process."

John Monroe

Like Mr. James Mr. Monroe also began his presentation by explaining what his organization does. Watershed associations, which may go by different names, are an emerging sector of the community. "My prediction is that within fifteen years these organizations will be as well known as the Massachusetts Audubon Society," he claims. Watershed associations are a maturing kind of organization and developing a funding base is a critical part of that process. There is no limit as to what is in bounds or out of bounds for an association.

The definition of a watershed organization is "a group that defines an area on a map that is the watershed of a particular river, and your mission is to look after the land and water resources that drain into that river. It has tremendous logic in terms of public policy planning analysis, but is not the dominant way that decisions are made."

Mr. Monroe said he uses information from Ivan's agency about aquifier yields and so forth (done a watershed basis) but the association's main job is to convince towns not to think in terms of their own boundaries but to think in terms of the aquifier districts that the USGS might put together. He explains, "we are a link between the scientific and technical community and the policy community. We are not making policy; we don't grant permits but we do a lot of lobbying and cajoling. We try to translate some of the scientific data into public policy and public support for that policy. It is a big job, an infinite job. I never leave the office feeling I have wrapped up the week."

Mr. Monroe went on to describe a typical week which involves the following: time in the State Congress, back to the office to teach kids what a watershed is, next, a newsletter, next a call on an oil spill. "We go look for it, call the pertinent agencies and try to help/coordinate." It is a watch dog operation, although it is important to set priorities and not get dragged into too many "fireman" type responses.

The association may also "walk through" a potential development site with a developer. "Not because we grant permits but because we can make a strong case for or against a certain project if we feel it is warranted. We have been around for twenty four years and have a reputation for being objective, which means developers may come to us before they start a more public process. "We are not, however, an anti-development organization. We have strong principles about what land should and should not be developed, but we don't expect to stop development on the Charles."

Mr. Monroe continued to state that the most frustrating part of the job is that the work is never done and the most gratifying is that the work is important. "In a small non-profit you must be a jack of all trades, a master of none. If you have a short attention span it is great. If you like cash flow and stability in your organization and to know what your schedule is three weeks in advance, then don't get lined up with a small non-profit organization." This rule can be applied to most small non-profits, maybe even for state agencies as well. There is a lot of uncertainty about what the organization will be doing next as well as the funding it will receive.

To get beyond a certain level, a graduate degree will be necessary. It does not have to be in hard science. Mr. Monroe's orientation is in public policy, and the interface between science and public policy. There are people who become executive directors who come from hard science backgrounds but it is not essential. He explains, "on experience to gain in school. I am advocate of a liberal arts education, for learning how to learn."

You should make sure that the job you take you take on terms that are acceptable to you. In a broader sense, do not fear rejection for certain jobs. Those people that rejected you may have done you a favor; in the long run, you were not the right person for the job. Finally, he explains that all the rules you hear about the job search process will be broken at some point. "I interviewed for and got a job where, during the first interview, I didn't even know what the position was. Someone else had submitted my resume."

Judy Wagner

Ms. Wagner started her presentation by describing her career path. "I did not start in environment, I wanted to teach. But a stint in public school teaching convinced me that I did not have what it takes." She wound up working for a consulting company, dealing with educational issues. However, the company soon shifted its focus to environmental issues and although she did not have the relevant experience she learned most of the appropriate skills on the job. "Although I knew nothing about the process, I was in place and had the contacts and ended up doing the work."

Ms. Wagner continued her career shifting her emphasis several times, working in consulting, volunteering on the side, working for a

nonprofit, earning her masters while working full time for the Boston Urban Gardeners, a group she founded.

She eventually heard about a job with Massachusetts Fish and Wildlife working in a soon to be set up program on rivers. She explains, "I was at a point where I knew what I wanted, what would work and what wouldn't, so I interviewed and grilled them. It is the best job I have ever had in the sense that it is ideally suited to where I am at a particular point in my life."

The agency is one of five state environmental agencies in Massachusetts. It is charged with managing the state wildlife resources (including fisheries). Fifteen years ago it was a stocking and maintenance operation for hunters and fisherman. Now, however, it is management of the habitat and resources. This reflects an amazing shift. It represents a new and different approach, thinking about changes that have been made in the environment, how to monitor stream health and how to restore natural conditions.

Her agency's programs are unusual, because they view citizen involvement as the cornerstone of environmental management, now and over the next several decades. This is not the prevalent attitude in most agencies. Now in age of budget cuts, more and more of her agency's view is being confirmed; i.e. without citizen support and involvement, environmental management will not be possible. She explains, "certainly, if you want to help the ecosystem, you have to have people changing their daily habits."

The skills she sees as being necessary are the ones she has applied in a number of different jobs: organizing skills, educational skills, how to get people to talk and deal, out and out planning, management skills, keeping people and things moving and keeping projects on track. Program development is also important, taking an idea and figuring out how to make it happen.

Some of the activities in a typical week involve: channeling corporate resources to environmental groups, promoting a recognition of the need for some new legislation on river management, working with a new strike force of river watchers, interviews with potential interns, budget work, and meeting with various river associations. The key word is unpredictable.

Questions and Answers

Q *With a B.A. in hard sciences is it appropriate to continue in the sciences or switch to business administration?*

Ivan James responds that there is a need for skilled scientists with broader backgrounds, able to communicate with others; i.e. a switch to anything else might be appropriate if your work does not require higher science degrees. People who are most valuable to him are very well grounded in one field but able to see across fields and have a grasp of broader issues beyond their own field.

John Monroe says we need scientists who can write, who want to write, as journalists, investigative reporters, in any way which can

help to educate the public on environmental issues. Journalists are often fairly accused of not understanding technical issues.

Q *With a B.S. in Biology, what next step should I take to increase the chances of getting lab work, and for getting a job which involves outside work?*

Ivan James says scientists tend not to do much lab work unless he/she is a bench scientist because there are no small labs anymore, only large labs, either private, state or federal, that are contracted to do the work. You will use your lab skills to understand the data you are collecting, to know what kind of lab analysis you might need and how to relate that analysis to the environment you have looked at. Continue, he says, on the science side of the issue, although not necessarily within biology, to be better able to integrate these elements into your analysis.

Q *Ms. Wagner, how did you pull yourself through the hard times of volunteer work?*

Ms. Wagner responds "perhaps times were different." She was single, she cared about her work. It is important to recognize that you might not be living high, but that it is part of the process.

Q *All these careers in rivers, what about careers in lakes?*

There are lots out there, although given state and local budget cuts, the national level might be better place to start.

Q *What about a degree in resource economics, will it be useful? And what about ocean related issues?*

Judy Wagner says that she believes that, although it is not well recognized, resource economics is on the cutting edge of resource utilization and interaction with local and national economics. Jobs are out there, and maybe three years from now it will be a recognized field, but in the meantime getting a job may mean some creative marketing. Ivan James says that in particular the federal government lands in the west require the types of skills that would be associated with this type of degree. As far as oceans are concerned, the interaction between rivers and oceans in the form of estuaries involves a lot of resource economic analysis.

Q *Environmental jobs all seem to require on the job training. With a degree in chemistry, lacking an environmental orientation, how does one get on the job training?*

Since probably ninety percent of jobs are not filled from newspaper advertisements, use networking, make your own list of potential employers. Do not be afraid to use the informational interview technique in which you talk to someone without the express objective of getting a job, but of getting information, names of other pertinent people with whom you might talk. Also be a volunteer or do an internship.

Q *What role does the environmental geologist have?*

It can be in so many places doing so many things. Land use planning, departments of geology, there are lots of opportunities.

Q *I would like to work outside. Yet, a hydrologist tells me that the field is going into computer modelling and advancement means getting out of the field. What really happens to the outdoor career after a short time?*

Ivan James replies that if you are in research you may spend a third or more of your time outside. Project people still have a mixture of field and office. Once you reach supervision and management, you have to "invent" field work, going to see the field operations, being the flunky on the job, trying to understand the problems of the field. At the entry level it is common to spend half your time in the field. Project work is the key to being in the field, and may become less important as you move up in your career. He also points out that individuals change and that the perspective on field work may change.

John Monroe notes: The Directory of Water Related agencies for Massachusetts has just been updated. It is an excellent source for names and numbers of those responsible for water issues in Massachusetts. Call the Division of Water Resources at DEM for a copy.

Ivan James points out that all panelists have a demonstrated willingness to be mobile, both in physical terms of where they have lived and in a job sense of moving within the organization, of doing different jobs. ■

Conference Note Taker: Neal G. Walker

A Breath of Fresh Air: Working in Air Related Issues

- Jim Rogers, Vice President, EUA Cogenex Corporation
- Fred B. Weeks, Environmental Engineer, US EPA Region 1
- Timothy Williamson, Assistant Regional Council, US EPA Region 1

Editor's Note

The panelists for the air session were all optimistic about the future of air protection. It was felt that the funding for air pollution issues will increase as public awareness continues to grow. With the recent concern about ozone depletion and the greenhouse effect we have already seen the first stages of increased public reaction to an issue that has previously been misunderstood or underestimated. Many of the opportunities in air issues require a strong scientific grounding, particularly chemistry, however, there are also opportunities for those with other backgrounds such as legal training.

Jim Rogers

Jim Rogers began his presentation by describing how air issues have changed over the years. He demonstrated how many of the earlier efforts to clean up air pollution were short sited and often misdirected. For example, in the corporate sector, when Mr. Rogers first started working, environmental managers were virtually unknown. Companies assumed that environmental problems could be worked out and environmental managers would soon be obsolete.

Government agencies were still developing strategies that were decentralized and hard to coordinate. There was no EPA, only an Air Pollution Agency. States were developing air control plans aimed at ambient air standards for only a select group of pollutants (carbon monoxide, sulfur oxides, particulates, ozone, etc.).

Mr. Rogers explained that many solutions were misdirected and the harmful effects of the pollutants were underestimated. Air pollution was not thought of as global but rather a local problem, with solutions such as dilution and high smokestacks. Man's emissions of particulates and other pollutants were only a small fraction of that found in nature, and it was thought that nature's "cleansing action" could equilibrate the local air space.

Mr. Rogers continued his presentation by showing how the incorrect assumptions of the past contributed to today's major issues. Now the key issues are the greenhouse effect, ozone depletion and acid rain. Because carbon dioxide was considered safe, carbon monoxide was converted to CO_2 as a way of rendering CO harmless. Chloro-flouro-carbons (cfcs) were considered the safest solvent available, being so stable they would not react in the lower atmosphere and cause health problems, causing problems today in the upper atmosphere. Man has overestimated the ability of the earth to cleanse the contaminants of acid rain and also underestimated his contribution of these pollutants.

As another example of shortsightedness, Mr. Rogers pointed to a time when environmental managers used to do acute toxicity tests on plants and animals, but these tested only for short term effects, ignoring the health hazards of long term exposure.

If you are interested in trying to correct many of the mistakes made in the past, and still being made today, Roger's affirmed that industry is a good base to work from. Companies need to be enticed into changing. They often want to do the right thing but do not know how. The easiest way to promote change is from within. It is easier to discover what is being done wrong, to find solutions and implement them.

According to this philosophy, Mr. Roger's current company works very closely with industries, and other organizations, helping them to attack energy usage by using conservation, load management and cogeneration techniques. His company goes into businesses, hospitals and colleges, showing them how to run the institution or company using a lot less energy. As it is cheaper for a utility company to pay for this service than to open up a new power plant, everybody wins.

Finally Mr. Rogers made some general comments about societal changes. Industry is not the only culprit; society as a whole needs to change. For example, energy use in America: America uses far more energy than relative countries such as Germany or Japan. The automobile is one of the biggest users of energy and contributors of green house gasses; and the largest single use of CFCs is is in automobile air conditioners. These are very serious problems that need to be addressed throughout our society.

Fred B. Weeks

Surprisingly, Mr. Weeks concentrated on water pollution in most of his coursework. However, the EPA is flexible enough to allow him to switch back into water pollution if he so chose later on. He claimed that he was a good example of someone who was able to combine his schooling with on the job training in order to work on issues that he didn't originally expect to be a part of.

Mr. Weeks went on to describe the work that his section does. The main role of the control, technology and compliance section is

enforcement of the Clean Air Act, which protects public health and welfare from harmful air pollutants. Primary standards of the Act protect human health, while secondary standards protect plants, materials and animal health.

Mr. Weeks' section has six to seven engineers, each assigned to a state, his assignment being Massachusetts. Each state must inspect a certain amount of sources each year, and carry out enforcement action, such as fining, when necessary. Mr. Weeks oversees and takes part in inspections and compliance programs that ensure federal regulations such as the New Source Performance Standards (NSPS), National Emissions Standards for Hazardous Air Pollutants (NESHAPS), and State Implementation Plans (SIPS).

Mr. Weeks is the lone civil engineer in a department of chemical engineers. In-house training facilitated his placement in a field in which he had little training. He is excited about his field and hopes the new Clean Air Act will be passed, causing more companies to be responsible for their emissions.

Timothy Williamson

Mr. Williamson began his presentation by explaining that his field is somewhat different from the first two speakers. Unlike Mr. Week's and Mr. Roger's areas of concentration, a career in environmental law does not depend on scientific expertise, although it is helpful. If you are interested in a legal career, study what ever interests you as an undergraduate, and when you get to law school concentrate on your legal skills. As long as you are not afraid of math or technical areas in general you will do fine.

He found it necessary to work in a large corporate law firm in order to make much needed money. During that time he kept his eye out for work in the public sector. He was told that there was a lot of money and publicity in waste management but more visibility and interesting work in air issues. He has found the work gratifying and enjoys the fact that cases are against one company at at a time instead of thousands at a time, as in hazardous waste suits, because he can really get involved with the specifics of each case.
Such large cases as the hazardous waste suits do create exciting opportunities in alternative dispute resolution, as traditional judicial mechanisms are not sufficient to deal with the litigation. People in the field look to arbitrators and mediators to resolve tough technical issues or authority disputes in these big cases rather than relying on an attorney to deal with them in court. This will be an increasingly important area.

When starting your job search Mr. Williamson stated that knowing where the money is being spent is the key. But he pointed out that this is often difficult to determine because funding is in a constant state of flux. If the new Clean Air Act passes it will excite new interest and hopefully a new inflow of funding.

Mr. Williamson explained that today funds for environmental issues have been inappropriately distributed. A comparative risk assessment of the regional environment showed that the most pressing problems are in air issues (radon, interior air pollution, acid rain, ozone in terms of urban smog) then water related issues, then hazardous waste. This is somewhat intuitive as airborne chemicals can travel to cover vast areas, whereas hazardous waste sites are very localized, with water pollution coming somewhere in the middle. Comparative expenditures in these same groupings show hazardous waste fist (Superfund), water second (municipal grants), then air.

Finally, Mr. Williamson concluded with a general plea to society as a whole. He explained that it is crucial for people to get out of their cars, and get used to fabrics that look less classy and paper that is a little less glossy, as these are some of the practises that degrade the air.

Questions and Answers

Q *What energy alternatives are available for cars, such as solar power?*

Mr. Rogers explained that solar powering is not feasible for the day-to-day usage of cars in this country. You'd need panels by the yards, and if the sun wasn't out, you'd need batteries that are very heavy. The best solutions are super-efficient automobiles, there are engine and car designs that get up to 60-70 mpg, and mass-transportation.

Q *I have a biology degree, but am very interested in air issues. How can I get into the field?*

Mr. Weeks claimed that people with biology and chemistry degrees used to get jobs in the section affiliated with his, the policy evaluation section. Increasingly, however, both the policy and compliance sections are accepting more chemical engineers due to an increased need for technical knowledge. Mr. Weeks suggested taking courses in chemical engineering.

Mr. Williamson went on to explain that there is a risk assessment process in each of the areas of air, water and waste testing the impact of substances on people and other forms of life, and determining enforceable emission levels. Concentrated in the EPA branch at Research Triangle Park in North Carolina, these processes provide an area for biologists including the entry-level.

Mr. Rogers finished by saying that it is absolutely crucial for the environmental field to have a chemistry background (basic organic and inorganic); and for the energy field, high school physics and common sense. In both fields, common sense is more important than anything else studied in college.

Q *What industries will be affected by the new changes in the Clean Air Act?*

Mr. Williamson explained that the new control technique guidelines will affect the manufacturing of automobile refinishing, consumer solvents, consumer products, architectural coatings and various elements of the electronics industry doing coating. As more comprehensive legislation is passed, though, smaller and smaller site sources will be effected—local dry cleaners, gas stations and hair salons (the last perhaps too minor).

Q *I'm trying to decide what direction to take environmentally: whether to further my environmental biology education or go into law. What is the availability of paralegal positions in the EPA?*

Mr. Williamson replies that the EPA hires JD's at the cost of paralegals already, so it is simply not cost-effective for paralegals to be hired, however necessary they may be. In the Superfund agency, where the money is, however, they are looking for paralegals now. You might also look to the Department of Justice in Washington, D.C., where the environmental enforcement sector is hiring lots of paralegals.

Q *Does the EPA hire engineers to try to find alternatives to the toxic substances it tries to control?*

Mr. Weeks states, "no research is done at the local level."

Mr. Rogers continues by stating that even at headquarters in toxics reduction in Washington, any of this type of work is farmed out to consultants, of which there are very many.

Mr. Williamson concludes that the way the EPA works is to make the fines so high that the private sector is forced to find another solution by their own means.

More information:

The Air and Waste Management Association April, 1989 issue of JAPCA lists local and regional air agencies.

The EPA last year published the Directory of New England Environmental Groups with all of the non-profit groups and agencies, receiving much praise from all three speakers. ■

Conference Note Taker: Judy Shatkin

Beyond Bugs and Bunnies:

Careers in Fish and Wildlife Management

- Dr. Deborah Schildkraut, Director, Research and Education, Metro Parks Zoos
- Dr. John Fitch, Executive Director, Mainwatch Institute, Adjunct Associate Professor, Tufts University
- Thomas E. Bigford, Branch Chief, National Marine Fisheries Service, National Oceanographic and Atmospheric Administration

Editor's Note

All three speakers stressed that people who are getting started in Fish and Wildlife Management need to gain experience through work. They suggested that internships, both paid and voluntary, are an excellent means of learning about the field. In addition, they said that to be successful in this area one must master a variety of skills. The ability to communicate well and use computers effectively, for instance, will prove to be of great use in pursuing a career in fish and wildlife management. Traditionally this has been a very competitive field. However, the application of new fields such as toxicology and restoration ecology will hopefully mean more opportunities in the future.

Dr. Deborah Schildkraut

In giving a brief history of her employment, Dr. Schildkraut said that she started as an instructor at the college level about twelve years ago. During that time, she also worked as the director of research at the Franklin zoo and the state zoo at Stoneham. She is currently a tenured professor at the University of Lowell. "While I enjoy teaching", Dr. Shildkraut confessed, "my first love is working in zoos". Realistically, she said, an association with a university is necessary in order to fund research. And, indeed, her connection with the University of Lowell has proved invaluable in that sense.

As a student she was greatly influenced by meeting Conrad Lorenz (animal behaviorist), and Rachel Carson (environmentalist and author). She studied animal behavior and ornithology. These

days, her area of specialization is applied animal behavior research. She works, primarily, with the two species of great apes. She emphasized that she always tries to contribute to the knowledge base in the field. She has been involved in developing species survival programs. "Twenty or thirty years ago, zoos didn't think about creating sensible breeding programs", Dr. Shildkraut explained. "As a result, zoo animals would become inbred. Now there is a nationally coordinated effort to develop animal management standards (ethograms). Zoos are working together to build a body of breeding data through cooperation of research."

When describing the type of experience needed for the field Dr. Schildkraut explained that most entry level zoo keepers have bachelors degrees as a minimum requirement. Curators typically have masters degrees upon entering the field. There are many other skills that are of great use in the work being done at zoos, as well. For example, people with experience in public relations, marketing, horticulture, and/or library sciences are needed. "The important thing is that you must have the appropriate sensibility for animal conservation." Volunteering is a great way to get your foot in the door at zoos. Your chances of being hired will improve tremendously when you become a known quantity.

Dr. Schildkraut concluded with some general advice, stating that "work in this field is more than a job; it's a life style." A typical day might find me working on a research project at five A.M., participating in a television interview later that morning, lecturing in the afternoon, and attending a fund raising dinner in the evening. You have low pay and long hours, but the rewards are great.

Thomas E. Bigford

Mr. Bigford began his presentation describing one of the typical issues his agency deals with. Remote sensing technology utilizing signals from satellites allows commercial fishermen to know exactly where fish are. As a result of this advance in technology, populations of some species of fish are being depleted rapidly. NOAA, the National Oceanic and Atmospheric Administration, a division of the U.S. Department of Commerce, studies issues of this kind. NOAA is concerned with maintaining a balance between economic interests and preservation of natural resources. They are in a position to regulate what the fishing industry is allowed to do in order to preserve endangered species.

In describing NOAA more specifically, Mr. Bigford explained that they employ about ten thousand people, most of them in Washington D.C. Mr. Bigford's division of NOAA, the National Marine Fisheries Service, is located in Gloucester Massachusetts. "We are a service oriented organization", said Mr. Bigford, "and cover a wide variety of issues. We don't do pure research. We deal, primarily, with management issues." NOAA often engages in the composition of regulations, so there is a great need for people who can think and

write clearly. There is also a need for people with training in the pure sciences and in library science.

NOAA monitors the condition of whales, seals, sturgeon and most every other marine species with the exception of birds. To that end they do a good deal of data collection and analysis. Opportunities exist, at NOAA, for working on both land and sea with atmospheric and marine issues. Mr. Bigford said that working for the federal government offers opportunities to work on issues, like global warming, that are too broad in scope to be addressed at the state or local level.

When discussing employment opportunities he noted that there are typically thirty applicants to each job advertised at NOAA. On the bright side, however, many NOAA employees will reach retirement age in the next ten to twenty years. In addition, said Mr. Bigford, the public is beginning to realize that more people are needed to handle environmental problems. Legislation passed in the 1970's continue to result in new jobs in this area. President Bush has also been addressing the demand for reallocating funds to environmental work.

Dr. John Fitch

Dr. Fitch related a story of how the U.S. Fish and Wildlife Service wanted to promote the reproduction of the common turin, in the South Pacific. Their initial solution was to kill the animals that prey on the turins. That doesn't work well, he said. We need to establish better methods for understanding ecosystems. Until recently, we have been looking at one species at a time. The field of fish and wild life management is changing rapidly. Academic programs may not cover the latest trends. This means that there are great opportunities to get involved in ground breaking areas like restoration ecology, toxicology and risk assessment, to name a few.

Dr. Fitch's background is impressive and varied. He studied anthropology and animal behavior at the University of Kansas along with zoology and biology. One summer he went on an archaeological expedition and on another occasion he went on a camping trip to study rabies. Field work in biology can be a great learning experience, said Dr. Fitch. When he was finishing school, the Smithsonian called to invite him to participate in a research project. He spent the next two years on a boat in the South Seas studying the ways in which humans and nature interact.

Dr. Fitch then earned an M.S and PhD. at Michigan State University in systems ecology. He set up a research program to study the effects of logging and burning on animal species in the Michigan woodlands. He also started a program in animal behavior for the veterinary department at Michigan State. Subsequently, Dr. Fitch was summoned to Washington to help develop the National Non-Game Bill adopted by President Carter. The bill passed, but President Reagan later cut funding for the project.

Presently, in addition to teaching at Tufts University, Dr. Fitch acts as chief scientist for the Audubon Society. His duties there include management, fund raising and setting the research agenda. He performs a kind of environmental triage, deciding which issues deserve the attention of post doctoral research faculty. He also helped in giving birth to "Maine Watch", an environmental organization that deals with environmental, social, and economic issues in Northern New England.

Dr. Fitch said that in order to be most effective in this field you must build a specialty of expertise. In addition, however, he stressed that you must "swim against the tide" by being a generalist. Be flexible. Pick up as many skills as you can. And most of all, take charge of your own professional development. "Opportunities exist", said Dr. Fitch, "get out there and talk to people".

Questions and Answers

Q *Are there any opportunities for those interested in Entomology?*

Dr. Schilldkraut replied that this is an expanding field in which she expects to see more and more opportunities.

Q *Are there any kinds of opportunities for educators at the zoos, even at the volunteer level?*

Dr. Schilldkraut replied that there are many opportunities for educators who would like to volunteer at the zoo. The hours are flexible, full or part time, and the zoo will provide the training. ■

Conference Note Taker: Benjamin White

"Who's Paying For It?" Careers in Fund Raising and Foundation Work

- Suzanne T. Watkin, Executive Director, The Boston Globe Foundation
- D. Dickson Henry, Jr., President, New Hampshire Audubon Society
- Bill Butler, Director of Communications and Special Projects, The Pew Charitable Trusts

Editor's Note

The speakers in this panel had two different perspectives. The first from those working within foundations, and the other from the fund raising side. The Two foundation speakers stated that philanthropic work does not always pay well but is rewarding in other ways. It is a good chance to learn a lot about other programs and organizations and often gives one the feeling that they are making a difference. The fundraising perspective emphasized being an entrepreneur and gaining experience. Finally, the abilities to write and speak effectively are extremely important for both fields.

Suzanne Watkin

Ms. Watkin discussed the Boston Globe Foundation's commitment to community service and education projects which absorb the majority of the Foundation's funding. Historically, only 5% of the funds available were actually dispensed on "environmentally-oriented" projects; not by choice of the foundation, but rather due to a lack of proposals in that specific area. In addition, she notes that many of her organization's funds went out to start-up, grass roots organizations as seed money, with very little going into project sustenance of already existing groups.

One encouraging note was that she expects to see an increase in funds spent on "environment projects" next year, after the Foundation Director's review.

Dick Henry

Mr. Henry feels that in order to make a difference in fundraising one has to be a very motivated, entrepreneurial go-getter. Education is "for the birds", experience is the name of the game. He adds that

the largest drawback when working in fundraising is the psychological problem of asking for money. He says that it affects everyone but we shouldn't be embarrassed. There is over 100 billion dollars given out each year by foundations and individuals and the amount that you receive depends upon the soundness of your project proposals and your personal skills.

The concept of a non-profit entrepreneur was discussed as well. Mr. Henry asserts that there are thousands of environmental jobs available which aren't advertised, or are not even part of a formal organization. If somebody has an interest in a certain project or issue, they should write up a proposal for funding and create their own job in the process.

Mr. Henry concluded with the following advice. In order to be a successful fundraiser, one must first and foremost be a good salesman. This includes using one's personal skills, dealing with feelings about money and above all keeping one's sense of humor.

Bill Butler

Mr. Butler gave a general overview of the US foundation's grants to environmental projects. He stated that only 100 million dollars were earmarked for environmental projects by a total of 93 different foundations within the United States last year. This is not in any way indicative of what is really available for such projects however. There are plenty of funds available, you just have to look in the right places and be good at your job.

In terms of careers, he emphasized that this is not the business to be in if one is looking for a substantial salary. Of the positions available in large foundations There are perhaps 90 paid environmental jobs within large foundations nationwide and perhaps one half of those are predominantly clerical in nature. In general, those jobs which do exist fall into the following three categories:

1. Management – Directors or program directors generally earn between $50–150,000/year, of which there are perhaps 30 in the country that are environmentally-related. Their duties include generating guidelines, making presentations to the Board and setting foundation priorities.

2. Program officers – The program officers are in charge of running the different programs within the organization. They earn between $35–60,000/year.

3. Program associates – Most of these people are fresh out of school. These tend to be entry-level positions which very rarely lead to promotions unless one has an advanced degree. The work is perhaps one half thoughtful, and one half administrative.

Mr. Butler adds that it is very important to keep in mind, whether one is applying for a job or soliciting funds for a project, that one is dealing with organizations with vested interests and oriented around certain ideals.

Virtually all questions directed toward the panelists dealt with the question of "how can I get money for my project?" The answers were predictable: Write up strong proposals, tailoring them to the individual foundations, and try to meet with the people making the decisions personally. Be polite and follow-up on your proposals. ■

Conference Note Taker: Geoff Merrill

"Can We Have Class Outside Today?": Environmental Careers in Education

- Joshua Cline, Chief of Visitor Services, Breakhart Reservation
- Dr. Malcolm Hunter, Associate Professor of Wildlife Resources, University of Maine
- Dr. Shirley Griffen, Environmental Science Teacher, Oakmont Regional High School

Editors Note

This session was particularly interesting because the three speakers, although involved with very different aspects of environmental education, are all employed by various state governments. They enjoyed the flexibility and the personal satisfaction of the work, but also warned about competition, salaries and making sure you were committed to the field. All the speakers, however, emphasized that the personal rewards far out weigh any other disadvantages.

Joshua Cline

Mr. Cline started his presentation by explaining he acquired his expertise by working with non profit organizations. After receiving his degree he worked in seasonal employment for four and a half years. This provided him an excellent opportunity to gain practical experience and to build up his credentials. He continued on and worked as a consultant to various state and local governments for two years. Finally he wound up working full time for the state of Massachusetts within the Metropolitan District Commission.

Mr. Cline continued his presentation by explaining the different educational positions within the MDC. He explained that there are three different categories of employees.

1. Rangers: They are the ones who wear uniforms and have the ability to tell people what they can or can not do. They must be friendly, intelligent and able to communicate with people at their own level.

2. Interpreters: Interpreters are those responsible for translating the language of the natural world into simple terms that the general public, who visit the parks, can understand.

3. Chief of Visitor Services: Oversees the Rangers and Interpreters.

The Hierarchy in the organization goes: Seasonal Employees, Rangers, Interpreters, Chief of Visitor Services.

Mr. Cline explained that, unfortunately, the MDC has recently experienced cutbacks, losing between seventy to one hundred positions. Obviously this will affect any hiring possibilities. However, Mr. Cline cited several other organizations where there were employment opportunities. They are: The Department of Environmental Management, Directorate of Fish and Wildlife, National Park Service, Residential Environmental Education Centers (good for seasonal employment), local nature clubs, and large museums. There are similar organizations in most states. Although New England has more opportunities than most Mid-West states Missouri is an exception; Florida also has a lot of jobs in this field.

In the next stage of his presentation Mr. Cline went on to describe some of the pros and cons of working in environmental education. First he described the cons. Salaries tend to be very low. It also takes a long time to advance. Turnover is low and competition can be stiff. Budgeting and staffing can fluctuate rapidly (MDC's budget has been cut by fifty percent in two years) and since the public dictates the working hours one is often forced to work over the weekend.

Some of the pros are that the job is "extremely rewarding;" the public is very positive, and often look up to him. "Education is the most effective way of helping the environment" he explained, "if you don't change peoples values, you will not help them change the environment." In this field you often work with creative and energetic people and you get the bonus of being able to work outside.

Graduate level training is not necessarily important, often experience and personality can be more helpful. "One must be ready to develop a variety of skills as there is never enough money to hire specialists." Mr. Cline also emphasized the importance of cover letters in that many employers do not often have time to peruse resumes thoroughly.

Malcolm Hunter

Dr. Hunter explained that the beginning of his career was difficult. The first four to five years required a lot of hard work and sacrifices. This should not , however, put people off. Eventually, things improved and today he has a great job with lots of diversity. The job entails three different roles: teaching different courses, research work, and public service (working for the state of Maine and for international nonprofit organizations).

There is no typical work day for Dr. Hunter. He teaches primarily in the fall with a concentrated schedule and in the spring is free to travel and pursue his other academic interests. The freedom involved with being an academic is its greatest advantage. He especially enjoys pursuing environmental political issues. He explains, "legislators often respect your opinion because they feel you have more information and therefor more credence."

Although for his field it is necessary to earn a Ph.D. Dr. Hunter also emphasized the importance of experience, because it promotes new ideas and independent research. The salary is not comparable to lawyers and business men but with the addition of research grants it is definitely enough to live on.

Shirley Griffen

Dr. Griffen explained that she had been teaching school for twenty two years. She did not, however, start as an environmental teacher. Instead she started as a biology teacher and evolved into environmental education.

Her normal day begins at 7:30 AM. She teaches a class of twenty five first graders. It is rewarding to watch adolescents learn yet at the same time she often finds it frustrating to keep motivating them. "Everyday is like being on stage, there is always a need to sell your product; so everyday you put on a new performance." Although she often has to work twelve hours a day there is the advantage of getting the summers off.

To become a teacher one has to get a graduate level degree. "The more credentials the better the pay" she claimed. Do not expect to start as an environmental teacher; get your training in one of the "basics," Biology, Social Sciences, Mathematics or English. "Do the relevant courses and later on you can manipulate the curriculum." She went on to explain that experience before your first permanent job is important. Consider being an aide to a teacher or getting a job with a community board in the summer.

"It is necessary to make sure you love kids. You are not going into it for the money; so be willing to sacrifice financially. It is no different from a doctor or a nurse. You are doing something for society. There are a lot of politics in education. When you go for a job appear conservative as this is the way the system works. There is a need to be a role model and you will be judged by the parents and the school committee."

Teaching allows you a lot of freedom. Dr. Griffen has had the opportunity to take two sabbaticals , one to get her Ph.D. the other to work as a consultant. She claims that when she decided to enter teaching she is sure she made the right decision.

Questions and Answers

Q *Mr. Cline mentioned that the state of Massachusetts is having budget problems. What about other states?*

Cline: It varies. Two years ago, Massachusetts was in great shape. The same is true for Maine. There are constant ups and downs. Unfortunately, environmental education has always been considered an extra so constant cutting takes place. In general, Massachusetts has more jobs then any other state in New England. New York is next.

Hunter: In the universities it is competitive to get jobs. But demographic studies suggest that there might be shortages in social sciences and humanities. Opportunities vary from state to state and in a number of states there are explicit residency requirements.

Q *Tell us something about competition.*

Hunter: Competition varies because of the market outside academia. There were six hundred applicants for one position teaching Biology. On the other hand, there are some jobs for which only five applied. In his field there are normally sixty to seventy applicants for one job.

Cline: I faced just the opposite problem as the job was seen as being for women. I try to encourage men as there is a need for role models.

Q *Dr. Griffen, how does a woman feel in the field?*

Griffen: In the sciences there were not many women, but they were the majority in elementary school. Normally there is a bias against women teaching sciences. There might be a crisis in the next five years because most of the women teachers are very old and will soon retire. This might reduce the gender bias.

Hunter: Academics believe in affirmative action, however it is still difficult to get women.

Q *How do you promote professionalism?*

Cline: Do research and have credentials that people believe are important. Most environmentalists are "bugs and bunnies" people. The seventies produced people who were hippies without credentials. The state government felt that they were not professional. I do research and get published which I show to the bureaucracy.

Q *Dr. Griffen, education is under public scrutiny and a lot of teachers are retiring. Can you try and speculate about teaching?*

Griffen: Unfortunately, the Department of Education does not recognize environmental education. So all that can be done is to teach all subjects with an environmental prospective. I do not know how this will change in the future.

Q *Dr. Hunter, as a state employee do you find you are ever constrained by the state?*

Hunter: This is not the case at all; in fact there are good relations between the college of forest resources and the forest industry. In a number of controversial projects I have often had to tell bureaucrats to go jump in a lake, even though they work for the legislature that we depend on for funding. This is the justification of the tenure system.

Q *Why is there less funding for environmental conservation than forest resources in universities?*

Hunter: In my college, there are six wildlife professors and twenty six forestry professors. This can be dictated by economics or political involvement. It also, however, has a lot to do with job opportunities for graduates.

Q *Mr. Cline, are there ever any conflicts with other departments?*

Cline: Communications are always a problem. When one department tries to stop encroachment on public land some other department will reject the move. This is especially disturbing considering that you assume you all have the same goals. ■

Conference Note Taker: Menoge Raman

Environmental Careers in Communications

- Paul Keough, Acting Regional Administrator, US EPA Region 1
- Dianne Dumanoski, Environmental Correspondent, *Boston Globe*
- Barbara T. Richman, Managing Editor, *Environment Magazine*

Editor's Comment:

The speakers for this session were very optimistic about the future of environmental communications. They emphasized the need to have a good grasp of the technical issues, strong communication skills, and a willingness to deal with a wide variety of issues. They all stressed the importance of environmental communications because it is one of the few ways to educate people and get them to change their lives. It was also interesting to note the extremely different paths that each speaker followed to reach their present position. Barbara Richman has been very directed, getting a lot of her training through formal educational programs while Dianne Dumanoski has had a variety of work experiences and learned many of her skills on the job.

Paul Keough

Paul Keough started the session be explaining that he became interested in communications in high school when he wrote an article (that was eventually published in the Boston Globe) in order to avoid detention.

Before joining EPA in 1971, Mr. Keough worked for the Patriot Ledger and later as Press Secretary for the Lieutenant Governor of Massachusetts. He went on to describe The Public Affairs Office at EPA which has two primary functions: to inform the public of the different programs within EPA and to promote environmental awareness. In communicating EPA's enforcement programs, the office has to be selective in its coverage. This is done in order to prevent the image that they are picking on one industry or another.

The Public Affairs Office also has several outreach or education programs. The main thrust is to get people to change their lifestyles through education. Outreach programs range from the "poem and poster program" for school children to informational briefs for legislators.

Turnover at EPA is low. Most of the jobs are for Superfund site managers. These require technical backgrounds. To work in the

public affairs office a background in communications is very helpful, however, lack of communication experience could be supplemented by a strong environmental protection background. There is also a need for attorneys. He concluded, "if you are considering entering this field, I would strongly suggest some kind of training in communications."

Dianne Dumanoski

Ms. Dumanoski explained that her career path was a little more eclectic than Mr. Keough's. Her previous work experience took her through political campaigns, printed media, television and finally back to the Boston Globe where she developed her current position as environmental correspondent. She likes print media because in television you are not provided the opportunities to explore an issue in depth.

It was during "the Watt debacle" of the Reagan administration that she was finally assigned to an environmental beat. She is pleased by the commitment of the Globe to environmental issues and hopes that other publications will follow suit in the next decade. She explained, "I expect the 1990's to be the decade of the environment. There is a level of urgency similar to that of the 1970's. I hope that a staff position will emerge for an environmental specialist." Ms. Dumanoski went on to explain that her career is not typical of most people in her field. "I haven't had much formal scientific training; I've had on the job training. As such I'm not sure I'm a good role model," she claimed.

In thinking about the future, Ms. Dumanoski reminded everyone of Rene Dubois' dictum "think globally, act locally." Environmental issues will increasingly be international. Accordingly, Ms. Dumanoski advised, "make yourself a citizen of the planet." Try to gain international experience. Learn a language. Consider joining the Peace Corps. She concludes, "if there is a way to spend time in a Third World Nation — not in cities or towns but in a village — time on the ground in a place like that would have done more for me than a year at Harvard or MIT."

Barbara Richman

Barbara Richman started by explaining that her career path was very directed from the start. She decided that she wanted to be a scientific reporter when she was in college. Accordingly, she created a major for herself that combined a wide array of hard sciences with courses in journalism. She continued to graduate school where she got her masters in science communications. She has worked at several publications including *Energy Newsletter*, which she started, *Journal of Forestry* and finally *Environment Magazine*.

The type of work you will be doing depends on the publication, which in turn depends on the audience. For example, if you are going to write for a daily than the coverage tends to be more basic.

Advocacy publications try to promote a certain issue. "Environment Magazine" tends to be more objective, and to provide good background information. A typical reader might be a student looking for a good introductory article on a science or policy issue. The material is not produced from staff reporters. "Environment" solicits and edits heavily.

The work is dynamic and often involves long hours. You have to be able to work with deadlines. There are also other types of jobs. There are public relations jobs like Mr. Keough's, jobs in marketing, graphics and research. You must know your subject matter and be prepared to deal with issues ranging from economics to organic chemistry.

One final note, when looking for a job, do research. Follow up interviews, know about the organization you are approaching and the skills the job will require. However, also think about what skills you will acquire and whether or not they are in line with your career goals.

Mr. Keough added that it is often helpful to tailor your resume to the kind of job you are seeking. Networking is also extremely important.

Question and Answer Period

Q *My background is in film and television as a producer. I want to move into environmental issues. How can I do it?*

Paul Keough: You could try advertisers or public relations companies. A lot of places want to document what they are doing. There is a lot of environmentally related activity that is going to need documentation The next year is going to be a big one for the environment.

From the audience: CNN has already launched a new series called Earthbeat, for which they will be looking for regionally produced material.

Q *I'm contemplating a career change, I've been working as an editor for a trade publication. I'm definitely an editor. Where should I start in getting into environmental issues? Should I take courses or start writing letters?*

Barbara Richman: There are certainly more editing jobs than writing positions. My advice is to just write to people.

Q *Would you recommend courses?*

Richman: No.

Keough: There is a need for writers and editors in the internal communications departments of large corporations. Companies like Camp, Dresser and Mckee are looking for technical writers . Consulting firms, engineering firms, they all need people who can write precisely on technical subjects for them. "There is fifteen billion dollars worth of work to be done in clean ups and the like, that's a lot of opportunities."

Q *What about government jobs?*

Keough: There is the Department of Transportation, but you would probably have more luck with the EPA where we need people with journalism and technical backgrounds. It is important to be able to translate what the engineers are saying into lay man's terms.

Q *Are there opportunities with communications and consulting groups that address the needs of advocacy groups?*

Keough: Most advocacy groups have their own staffs. Some of these groups use pretty clever ploys to get their points across. A few days back one of these groups sent a delivery man to a staff meeting carrying two pizzas with a message across the top. Another time they sent "bananagrams:" bananas with a slogan on them. And that way, the advocates often get more attention.

Q *What about creative writing?*

Keough: There's the EPA "Journal." They could be interested in publishing creative pieces. They have a staff of people to do research and long range articles, to give room for opposing views.

Q *The environment has recently become an important issue again. Is this likely to wane?*

Dianne Dumanoski: In many ways issues come and go. It seems to be a result of whatever the "zeitgeist" is. It follows society's moods and perceptions. However, I think that the environmental issue will be different. It's going to be hot.

Keough: The twentieth anniversary of Earth Day, the Clean Air Act re-authorization and Bush claiming to be the Environmental President will all help to create a lot of enthusiasm.

Q *What about free lance work?*

Dumanoski: I can't say there is a lot of free lance work to be had.

Keough: Good clips are a good way to get started. But its a tough way to support yourself for a long time.

Q *I am the editor of a small local environmental bimonthly. There's been so much change. I'm wondering if there is still a need for a publication like ours. Is there a market?*

Richman: There is a need. Take oil spills. We haven't done a a story yet about the small spills that account for 87 percent of all the oil spilled. That sort of thing needs to be covered.

Dumanoski: The Globe doesn't get a lot of coverage on that sort of stuff. There is a need for in depth coverage. But you have got to remember that competition means survival of the fittest.

Q *Is the EPA going to take a pro active role on new issues?*

Keough: With Reilly in office, there is going to be a need for a lot more community relations, for example on Superfund sites or radon.

Q *What about being a job applicant? Should one know how to fit into an organization by, for example, presenting a new idea?*

Richman: Its rare for someone to come in and present a manifesto and succeed. But suggestions, in a low key presentation that say, in effect, "I'm the one your looking for," should work. But it all depends on the person.

Q *How long do you think this craze will last? What can we do to prolong it?*

Dumanoski: Hard to say. Some institutions will last. Others will be gadflies. But the jobs won't disappear. At each wave, there will be more institutions.

Keough: I think the issue is education. There is a need for awareness. ■

Conference Note Taker: Ned Hoyt

Pollution Does Not Need a Passport: International Environmental Careers

- Jessica Brown, Director of Inter-Regional Exchange and Policy, The Atlantic Center for the Environment
- Recardo Wray, Associate Producer, Interlock Media Associates
- Joris A. Brinckerhoff, President, Costa Rica Entomological Supply

Editor's Note

International Environmental Protection is both a diverse and popular field. All three speakers advised that it is important to focus your goals, learn a language and spend time in other countries before entering this career path. If you can show that you are committed to certain issues, rather than a vague altruistic purpose, prospective employers will be much more receptive. There are a lot of people who want to "do good" but not that many with the appropriate skills, determination, and experience that are necessary for international work. On the other hand, as Mr. Brinckerhoff points out, sometimes it pays off just to "go for it."

Jessica Brown

As Director of the Atlantic Center's international division, Ms. Brown works in cooperation with conservation efforts in other regions of the world to offer workshops, professional exchanges, technical assistance and training opportunities. Prior to joining the Atlantic Center staff in 1985, she spent three and a half years in the Turks and Caicos Islands (British West Indies) where, as Executive Director of the Turks and Caicos Development Trust, she worked on marine resource management and environmental education projects.

She explained that one should "get substantial overseas experience. Learning about other countries and their conservation efforts is the only way to develop sensitivity and understanding of the conflict between economic and conservation needs." She went on to state that experience helps your credibility, "go for more than one

year...don't shy away from the Peace Corps." Longer experiences will allow you to "look at the broader picture."

Ms. Brown continued with a few more quick pieces of advice that she felt were very important.

Learn a language. It is very important if you are in another region. Ability in other languages is a "definite asset."

Consider graduate school, but remember it might not be necessary to do it right away. It's fine to do it early, but it's also possible to get experience first, and later work and go to school concurrently. (She has been working while studying for a Master's in International Development.)

Become geographically literate. The US has a horrible reputation internationally for being geographically ignorant.

Be specific. Focus on a problem or an issue. An interest in "international stuff" is simplistic and won't get you far.

Be geographically flexible in your interests. For example, "Eastern Europe and the developing world are facing similar issues."

"Be clear about your reasons" for working in the field; "altruism alone" might not be "appropriate, and is certainly not realistic or humble. Be sure that you like the work."

In summary, go and "find work that interests you, and then *think hard and work long hours.*"

Recardo Wray

Mr. Wray is primarily concerned with international development. However, through Interlock Media he has also gained experience in international environmental work. Interlock Media produces international documentaries and educational media about civil rights and environmental issues. He is especially concerned with environmental education as it relates to media. Mr. Wray received a BA from Brown University in Development Studies.

He chose development studies as a major because the program allowed him the flexibility to study a problem from different perspectives: political, social, cultural, and anthropological. He agreed with Ms. Brown about getting experience and developing an area of expertise; "hirers want experience and focus," not altruism and an interest in "international stuff."

Mr. Wray chose to focus on rural development and sustainable agriculture through an apprenticeship at UC Santa Cruz. A "burgeoning interest" in educational media led him to Interlock Media Associates, where he could continue in the field of development.

His responsibilities vary from office management to actual media production. A recent project has been the creation of an educational film to educate the Costa Ricans about the problems associated with deforestation. Almost all the pre-existing films were in English (not sub-titled), and many that were available in a language the Costa Ricans could understand were about an environment far removed, such as the Arctic tundra.

Interlock Media focused on the campesinos, small farmers, and on the dynamics and implications of deforestation for them. He explains, "the locals can see the mudslides, soil erosion and flooding and don't need a film to point out their problems." Instead, helping the campesinos find solutions to their land use problems by highlighting the combination of soil, forest, and watershed conservation possibilities was the focus of the film.

Mr. Wray has also had the opportunity to attend conferences and meet those from developing countries who are in the vanguard of the conservation movement. "A problem with the developed community in general" is its attitude that "we have the answers and can bequeath our knowledge to developing countries." That fallacy is diminishing as developing community members demonstrate a *better sense of how to put together appropriate programs.*

"Build expertise in fundraising." From the higher level multilateral organizations like the World Bank and AID (Agency for International Development) to small groups, fundraising "as much in as little time as you can" is "a battle to get used to."

Graduate school can help you develop an area of expertise, but internships and jobs provide substantive experience, which employers like. Two years of experience is more or less required. "The Peace Corps is a good option," he reiterated.

Joris A. Brinckerhoff

Joris Brinckerhoff is the founder and President of Costa Rica Entomological Supply, Inc., a company that specializes in the breeding and exporting of live butterflies. Begun as a backyard experiment in 1984, the company now employs seven people, exports approximately 25,000 butterflies per year, and is the first viable enterprise of its nature in Latin America. A liberal arts graduate from the University of New Hampshire in 1982, Mr. Brinckerhoff first went to Costa Rica as a Peace Corps volunteer where he worked for two years as a cooperatives advisor. He is now completing his M.B.A. degree at Babson College.

"By telling you a little bit about my career as a butterfly farmer, I hope you can find some themes or characteristics which are directly applicable to your own situation," Mr. Brinckerhoff began. According to all of the speakers, Costa Rica is a pretty special place. After all, "where else can you find more venomous snakes and environmentalists per square kilometer?"

Mr. Brinckerhoff graduated with a degree in economics and political science, training "very appropriate for butterfly breeding," he jested. He applied to the Peace Corps, and when given the choice between appropriate technology in West Africa and cooperatives in Costa Rica, he chose Costa Rica—and then asked a friend for some advice: "Where is Costa Rica?"

His position involved developing savings and loan programs with rural cooperatives and communicating exclusively in Pachuco,

"a filthy version of Spanish." He became intimately familiar with rural Costa Rican habits and culture—"as much as is possible in two years." While hitchhiking after the end of his appointment, he met a researcher who deals in butterflies. The concept of breeding butterflies was introduced from South East Asia, where it is a major industry. It is one of Papua New Guinea's leading exports. In Latin America, no one was breeding butterflies, a surprising fact considering its wealth of natural resources and the compatibility of butterfly breeding with another income producer, tourism.

Armed with a great idea, Mr. Brinckerhoff faced many challenges. The first was financial; he had only $1200 in his pocket from his Peace Corps position. The second was political; the formidable Costa Rican bureaucracy must grant a permit to export wildlife and charges $2 for each organism. That's fine for a few sloths, but it's prohibitive for hundreds of tiny butterfly pupae.

In addition, he had had experience neither in accounting nor in actually breeding butterflies. Butterflies require very specific food plants, media for breeding, and habitats. So, after convincing the Costa Rican government that a *crate* of fifty butterfly pupae is roughly equivalent to one larger beast, he headed off to "the woods" for a year and a half to learn about butterflies and the best places and seasons for collection. His manpower doubled when he met his future wife, who was doing economic research in San Jose.

After capturing live butterflies, they create an environment conducive to breeding, carefully raise thousands of larvae to the pupal stage, and then divide the pupae into those to be returned to the wild and those to be exported. They return ten times the captured number to the wild, representing an ecological contribution. Most of the pupae are exported to live butterfly exhibits in Europe, where visitors can stroll through recreated tropical jungles in which thousands of live butterflies fly freely.

Since in natural conditions only 2% of the eggs survive and in captivity the rate is as high as 90%, "I'd like to suggest that this is the closest thing I can think of to appropriate technology, as E. F. Schumacher described the term in ***Small is Beautiful***. Butterfly breeding has a rural base, provides employment and hard currency earnings, is a nontraditional export business, diversifies the economy, and stimulates interest and intellectual inquiry among the locals."

Now that the business has been established, Mr. Brinckerhoff would like to attain higher production levels, but more importantly sees the business as "an example of a challenge to people in any occupation." He hopes it will serve as "a model for others to emulate" because of its simplicity, its use of appropriate technology, its accounting for "the human factor," and its minimal resource needs. To realize his hopes, Mr. Brinckerhoff outlined three specific plans. Tourists interested in ecology flock to Costa Rica, eager to learn about the tropical jungle. By attracting those "ecotourists" to the farm to observe tropical butterflies, he could create an educational

forum in which other problems in Costa Rica could be discussed. Secondly, he would like to promote butterfly farming as an ecologically sustainable and economically viable enterprise which is ideally suited to be part of a "buffer zone" around national parks. Locals could breed butterflies in their backyards, and by cooperating with their neighbors, could build a cottage industry. As a result, they would have more of a vested interest in preserving the parks, and current ecologically destructive practices would diminish.

As Mr. Wray also pointed out, people living in rural areas often don't distinguish between their land and national park land, so changing the land use patterns of those living near the park areas is vital to the integrity of the parks. During the six years Mr. Brinckerhoff has lived in Costa Rica, he has seen little positive communication between government policy makers and the populus. A decree to protect some land is issued, and no one bothers to explain to the people living there what that means and why the parks are so important. Mr. Brinckerhoff would like to bridge that gap by attracting the public to lively and humorous presentations designed to give them some insight into their role in the ecosystem.

He, too, finished with some recommendations.

1."Experience abroad is essential." Sound familiar?

2. "Languages are vital—sorry to beat a dead horse."

3. "Seize opportunities." His theme has been entrepreneurial talent and exploring the ecological ramifications of his ideas.

4. "Learn how to type . . . it's an absolute vital skill." No matter what you do, you will spend some time sitting before a keyboard. Especially if you are a consultant, and you're charging high hourly fees, you don't want to spend more time than you have to pecking away at the keys.

5. "Have fun. Don't do something altruistic unless it's fun."

6. "Maintain your integrity; it's your number one asset." Former dealers in butterflies had hired locals to go out and collect butterflies, and then sold the dead insects abroad. Needless to say, the bureaucracy did not look well upon butterfly dealers in general, and Mr. Brinckerhoff had quite a psychological barrier to overcome. Only endless letters to his clients and the government succeeded in changing their attitude and winning the special reduction in export taxes that made the business economically viable.

Questions and Answers

Q *Ms. Brown, in an exchange between the Atlantic Center, Poland, and Hungary, what issues would be particularly important?*

The main things in those countries are rivers and natural area management. The Atlantic Center became involved with those countries because the current funding trend favors programs in Eastern Europe. Since the Atlantic Center has been very involved with rivers management in New England and Newfoundland, it seemed logical to do some fundraising for the exchange. In Hungary,

protection of the Danube against the dam projects has been the primary vehicle for mobilizing environmental activists. Poland's severe industrial pollution and its impact upon wildlife have been important issues there.

Q *Mr. Brinckerhoff, you mentioned the concept of a buffer zone around national parks. Can you elaborate on that and other ideas that deal with the conflict between economic development and zones cut off from future development?*

After explaining some of the capital investments and transportation needs special to the industry, Mr. Brinckerhoff described how many individuals could raise larvae in their own homes; "all you need is some paper bags, some food bags, and a butterfly net." One person would then collect the larvae from his neighbors and bring it by bus to San Jose, where Mr. Brinckerhoff would arrange for export by air freight. In that way, rural locals would receive economic income without destroying the environment. "If a person is grazing the land next to the park, there's no difference (in land use) if butterfly farming is done or not since it takes up no space." He also pointed out that child care and pupae raising are compatible, so work done in the home could bring in hard currency.

Q *Is there a finite demand for butterflies?*

Because butterflies have only a two-week life span, the clients in Europe need a constant supply of new pupae. One problem, actually, is that in the enclosures the butterflies are free of predators and are capable of reproducing and consuming all of the available food plant. However, the concept of butterfly farming can serve as a model for other systems. For example, there is a woman in Costa Rica who is raising iguanas, a great source of meat. In Washington, the idea of sustainable development is very popular, but real suggestions are few.

Q *Ms. Brown, you started out doing field work and now do primarily office work. Was that a hard transition? What recommendations do you have for someone who enjoys field work and doesn't want to get promoted out of it?"*

Ms. Brown responded that she makes a real effort to spend about two months a year in "the field." She returns to the Turks and Caicos to give technical assistance and to other areas to give advice about getting local support and developing education outreach programs. She also named some national groups that have field positions: World Wildlife Fund, National Wildlife Federation, and Nature Conservancy. Most important, though, is "being unconventional in the approach to your own career." The Peter Principle (of getting promoted out of jobs that you enjoy and are capable in) applies to both international and domestic positions. Take on the "challenge... make a personal commitment to overcome" that problem.

Q *All of you have emphasized the importance of becoming specific, of developing an interest and gaining experience in that area. How do you know what to choose? It's so difficult.*

Mr. Wray responded that it's "an evolutionary process, and you might not find an answer quickly." He has been resisting the temptation to focus because of the danger of being pigeonholed. He doesn't want to compromise his wide interests and would rather find a position that "fits him." "The ultimate is to find a place where you have maximum influence and power. Grad school can help (from what I understand) limit your interests" if that is what you want.

Ms. Brown added that "trial and error" comes into play; "you don't have to find out what your focus is for a year, or two, or three. Give yourself a few years, a freelance period, when you're not tied down, and experiment."

Q *How important is a science background for credibility?*

Mr. Brinckerhoff replied, "I'm a good example of 'close your eyes and jump; you'll get experience somehow.'" Right out of college he wasn't hired because he was a generalist. He recommends "not taking the job offer with the most dollars, but looking at your options; will you be working with and under someone who has your interests at heart?" He noted later that he would "never be taken seriously in the scientific world; you need formal training to carry weight there."

Ms. Brown pointed out that it's easier to get jobs early with technical training as an undergraduate, but that every job is different. Technical training gives you a "framework" and is "handy," but you will learn the specifics on the job. "A good cultural background to start out is even more important."

Q *The three speakers pointed out that the local people know the problems better than observers who visit for a short time. Is showing the villagers how to change their ways, giving them options—are these goals?*

"The people we met do live with the devastation of deforestation," Mr. Wray began. By creating a dialogue, we learn from their solutions and point them towards others. It's important to maintain a "consciousness of people in relation to the environment. In Costa Rica, there is a tradition of homesteaders. They have a great deal of pride in clearing area on their own. When national parks are established, the government doesn't know that there are Indian villages there, and the Indians don't understand why they can't cut their own trees and why the parks are there." It's hard for them to appreciate the parks and understand that the parks are there to be enjoyed.

Q *How do you think poor farmers can enjoy the natural parks? Their primary concern is to feed their families. What alternative do they have?*

"First of all, awareness is the first step to action," Ms. Brown responded. "They have a long-term interest in the land." There is no single solution since each group has a relationship with the environment that is "specific to the culture, their own belief system and values." It is important to "explain why the parks are there,. . . to make clear that they are necessary to protect the resources of the watershed and habitat. Explain the real benefits to the people, and integrate economic alternatives with the message." She went on to say that 33% of Cost Rica is national park land, but the country has the second highest rate of deforestation in Latin America. She described two programs in Costa Rica where environmental education, tree nurseries, and handicraft markets are demonstrating ecologically sound economic alternatives to traditional land use approaches. ■

Conference Note Taker: Cordelia Pierson

Workshop: Corporations

■ Henry Lee, Executive Director, Energy and Environmental Policy Center, Harvard University

Henry Lee initiated this workshop with the statement that historically speaking, there has been very little opportunity for one to secure environmentally-oriented jobs within corporations, but that in the 1980s this has begun to change. Corporations are becoming increasingly aware of the fact that today they must become more environmentally conscious in order to remain competitive. Nevertheless, environmental jobs with corporations are limited. Following are a few which he feels are possibilities:

1. Environmental safety– Corporations are always looking for people with science backgrounds to deal with the "environmental safety" issue within the workplace, and with the "liability" issue with products that they produce. He cited the chemical industry as an example, illustrating his point with Mansanto Inc., which has over 80 people working on these issues in their St. Louis headquarters alone.

2. Consultancy– Environmental consulting groups are in the business of preparing environmental impact reports for companies and individuals wishing to acquire building permits for construction. On average, over 50 permits of one kind or another are necessary to complete this process. Once again, scientists with specific skills are in high demand here.

3. Environmental law– This is a fast growing field with many cases presently pending and thus, is a great opportunity for environmentally conscious job-seekers.

4. Financial counseling– Banks and other financial institutions are scared to death of liability arising from the environmental impact of their financing/loans, etc. They often hire counselors to deal with this issue.

5. Hazardous and solid waste management– These are both growth areas, though Lee feels that solid waste is much more pressing an issue at this time.

Future Trends

1. Prof. Lee feels that in the future, all executives must be environmentally literate, at least in the issues pertaining to the areas of operation of their corporation. He added that the environment will stand right alongside of economics, legal and business skills in an executive's repertoire of operational abilities.

2. There will be more in-house environmental offices in US corporations. Today they exist in the larger ones, but primarily as weapons in an arsenal, for use against aggressive environmental groups. This underlying inclination of corporate environmental offices will undoubtedly change in the future.

3. International environmental issues are becoming increasingly popularized, though Prof. Lee feels that there will not be a lot of openings in this field in the short-term.

Questions and Answers

Q *Do you feel that the globalization of US corporations would open up opportunities for US citizens abroad?*

Professor Lee responded that he didn't think so, but in fact, would argue that most globalization of US business abroad is carried out with the general understanding that local human resources will increasingly be utilized in the future.

Q *Question: What about the environmental literacy of executives. Where will they get it?*

Lee was unable to respond knowledgeably, however he did note that this just might be an area of opportunity for somebody with initiative. ■

Conference Note Taker: Geoff Merrill

Workshop: Consulting

■ Charlie Richman, Senior Associate, ICF, Inc.

Mr. Richman is a Senior Associate with ICF, Inc. Before this, he spent two-and-half years as an environmental consultant for the U.S. Environmental Protection Agency. He also worked for three years as a legislative assistant for Energy and the Environment for New York Senator Daniel Patrick Moynihan. Mr. Richman earned his Ph.D. at John Hopkins in the Department of Geography and Environmental engineering and a B.S. in Biology and Geology at the University of Rochester.

Mr. Richman's perspective was mainly from his consulting work for the public sector in Washington, D.C. In pursuing jobs, he said it is important to recognize that the federal government dominates the

schedule for hiring. January and early spring are best since federal money is being distributed to consultants for project activities. Conversely, August and September are slowest since September marks the end of the federal fiscal year.

Mr. Richman said that his firm and other consultants value candidates with strong writing and speaking skills. He said that a candidate's writing skills should be exhibited by his or her resume and cover letter. He said that at ICF, all well written resumes (about 1 out of 8) get circulated to managers for consideration.

In the interview, the candidate should be prepared to express some knowledge of the company. This shows not only that you are knowledgeable about the field but also that you have committed some time and thought about where you would like to work. In addition, it is important to show you know how to "structure a problem", i.e. research, analyze, communicate and implement. Along the same lines, it is important to show that you can get tasks accomplished.

Mr. Richman added that starting salaries vary depending on background, applicable experience, and the position the candidate will fill. For the D.C. area, typical entry-level annual salaries are:

$20,000 to $25,000 for policy staff
$20,000 to $26,000 for science staff
$20,000 to $30,000 for engineering staff

Questions and Answers

Q *How much freedom does the staff have in choosing assignments?*

Mr. Richman said that at ICF, you don't have much opportunity to select assignments initially, but there is much diversity in the type of work staff do. Staff can work on several projects simultaneously.

Q *How long are project assignments?*

Projects last from a few months to several years. Schedules often change many times during projects because the client often changes the scope of work.

Q *What is the difference between big firms and small firms?*

In small firms, there can be more variability in workload. He said that small firms also tend to focus on a specific area of expertise (e.g., waste minimization for industries). Consultants in the audience added that working in a small firm can also mean being responsible for a wide range of technical areas; large firms tend to have specialized departments.

Q *How much training is provided?*

Staff attend seminars, conferences, and in-house lunchtime presentations on various topics. However, he emphasized that most of the real training is "on the job." ■

Conference Note Taker: Martha L. Monserrate, CH2M HILL, Inc.

Workshop: Government Jobs

■ Lauren Seneca, Personnel Specialist, U.S. Environmental Protection Agency

When looking for a government job, the most important thing is to find the right office to go to. Look in the blue section of the phone book. Then, find a personnel person or a specialist to talk to.

The EPA is a large employer of engineers, biologists and scientists and entry level people have a good chance of being employed. There is tremendous turnover and opportunity.

Ms. Seneca outlined civil service procedures and mentioned the government application forms which need to be filled out (171 forms). She also explained the government rankings, or grade levels, for employment which are assigned according to education level and employment experience. Evaluations are given annually at which point a raise is possible.

She mentioned that the EPA regional offices primarily make sure that what should be happening is happening. If you are interested in a policy position, Washington has many of those jobs.

Questions and Answers

Q *If I worked in environmental education, would that experience give me a higher grade level?*

Not necessarily. The work experience must be directly related to the area you are being considered for.

Q *Is there a role for computer programmers?*

Yes. There is a lot of data which needs to be reviewed and analyzed.

Q *What are the categories of jobs at the EPA?*

Life Sciences; environmental sciences; geologists; environmental protection specialists (which specialize in organizing and writing).

When applying to the EPA, you must send your transcript, resume and a letter. She recommended that once a 171 form has been filled out, you should make copies before you sign it or put the job position in because you don't want to fill it out more than once if you decide to reapply.

It is very easy to transfer from one city to another once in the EPA.

Q *Is there use for financial analysts?*

Ms. Seneca: Yes, in contracts, etc. ■

Conference Note Taker: Elizabeth Schueler

Workshop: Nonprofit Organizations

■ Lee DeAngelis, Regional Director, The CEIP Fund, Inc., Great Lakes

Mr. DeAngelis broke down his presentation into five categories. They were: positive features about working in the nonprofit sector, the negative features, the range of opportunities, typical roles, and getting a job.

Positive features:

Nonprofit organizations are often on the cutting edge of policy development in the environmental field. Unfettered by the "bottom line", these organizations can generate and test new ideas more readily than many alternative organizations.

Nonprofits truly are "making a difference" both on a grand (national) scale and in local initiatives.

Since nonprofits are often small organizations, new employees with relatively little experience are often given major responsibilities quickly. Such organizations tend to be dynamic and entrepreneurial. Non-profits tend to be very people oriented. They often fuse a number of disciplines into a single mission. The emphasis is on team solutions.

Negative Features:

Fundraising is a constant concern. The pace and level of activity often leads to burnout. The pay is low; look forward to a career high in the $50,000 range (with a few exceptions). There are often low benefits; nonprofits often offer only medical and vacation benefits.

The range of opportunities:

The National Wildlife Federation's Conservation Directory has a complete listing of environmental nonprofit organizations.

At the international level there are large organizations like Greenpeace and the World Wildlife Fund. At the national level there are groups like the Sierra Club and the Nature Conservancy. There are also regional, multi-state organizations that exist to deal with regional initiatives centering on a particular shared resource such as the Great Lakes, coastline development, watersheds etc. There are also a great number of resource-based organizations such as land trusts, Friends of the Chicago River, etc. There are over 740 such organizations across the country. There are also many state level organizations such as the Ohio Environmental Council and local level organizations such as the Boston GreenSpace Alliance.

There are many groups and organizations that build coalitions which are geared toward building political will to enact legislation and launch community action. These groups are environmental educators, nature centers, arboretums, etc.

There are also nonprofit organizations that concentrate on other issues but will have an environmental arm, community development corporations which require environmental impact studies, or personnel conversant in the field.

Typical Roles:

It is most important to keep in mind that all nonprofits ask people to wear many hats. There are jobs that will involve program development, advocacy, and issue based research. There are services: a nature center's primary mission is to educate, other organizations offer consulting and management services. CEIP is a good example. You will always find a need in all nonprofits in the development/fundraising area. This is a very open area with a strong need for solid qualified candidates. Public relations is another area that all nonprofits are concerned with. Administration and management are two areas that are also in need of candidates with a wide variety of skills.

Getting a Job:

In Your Favor:

The process is a creative one. Nonprofits experience a high turnover rate. The hiring process is often simple in the sense that no entrance exams are required. Often there is not too much competition.

Not in your Favor:

The proportion of all environmental jobs that are in the nonprofit sector is small. Also, nonprofit organizations tend to be concentrated in no one area; this can make your job search very exhausting.

Gaining Experience:

Different ways to gain experience are: volunteer, pay your dues and build a resume, seek internships, and broaden your skills generally to cover some of the above areas.

The Job Search:

Try to conduct a broad geographical search. Research a broad variety of organizations. Do not hesitate to conduct cold calls and request informational interviews.

The Final Message:

Nonprofits need a wide variety of people. Do not be afraid to get out there and find out about the opportunities. ■

Conference Note Taker: Chris Shaw

Workshop: Internships

- Cindi Moor, Regional Director, The CEIP Fund, Inc., Northeast
- Julia Harrington, Associate, National Environmental Intern Action Project

Cindi Moor

If conducted properly, internships can be a most crucial and valuable tool when initiating a new career. An internship that is not conducted to meet certain requirements can be a source of frustration and a waste of time.

An internship is as important as a first job because you are being watched. Your success will affect future opportunities. It is also, however, an extension of your education and a time to ask questions and learn information and procedures that you will need later. Internships are important. Treat them as such and consider your search for the ideal opportunity very carefully.

Following are the keys to landing an effective intern position.

1. Determine your goals. Outline them specifically. Consider all facets: Do you want hands on or theoretical experience? What type of organization? What sector of business? What type of supervision or teaching do you need? Do you prefer a small or large organization? Do you want to work with computers, people, issues, numbers? What makes you feel good about a day of work? Try to weigh all these variables and be as specific as you can. Remember that this internship must answer your needs first to be of any use to you.

2. Students and recent graduates often have a hard time focusing their goals simply because they don't have the information to decide for themselves. If you fit into this category the best way to solve your problem is by networking. It sounds like a cliche but it works. Talk to people who do what you would like to do. This will help you focus your need. It is also important to remember that these contacts, even if they are not for current internships within those organizations might lead you to opportunities with other groups. Word of mouth is very important.

3. Brainstorm. Form a niche for yourself. Create a need for your skills within the market. One way to "create" an internship is to invent a project that will satisfy a company's goals, or find answers to specific problems that plague the organization or market. Be imaginative. This takes some thought. Once you have created this niche, make it unique, to fit your skills, hence, you and only you can complete the project.

4. Sell yourself, sell your project. It's your baby. Explain to your potential employers how you can help them (and they of course will in turn help you).

If you follow these steps you will find yourself in a worthwhile internship. Take advantage of this opportunity. Internship supervi-

sors will often make a special effort to guide and support intern work.

The intern search process just outlined is a good way to develop your own internship. There are other means of locating intern opportunities. These include: University/College Career Placement Offices will often maintain listings of formal intern programs and opportunities; organizations that usually take in extra help in the summer or for short term projects; intern clearinghouse organizations such as The CEIP Fund, Inc. and the Student Conservation Association which provide matching services for applicants interested in short term intern assignments.

CEIP and SCA can be very valuable as an additional tool for the intern seeker. CEIP can do much of the leg work for you and help you to determine the most logical intern position to satisfy your career ambitions.

Julia Harrington

Once potential interns have created a list of goals for their internship, they need to make appointments with organizations to let them know their availability to do an internship.

A list of resources for formal internships was handed out (see appendices). In addition, to the various listings, Ms. Harrington suggested that people find their own internship by doing their own investigative work. Organizations should be contacted, and an inquiry about internships needs to be made with a supervisor of the department of interest. After locating the supervisor, they must offer their experience and suggest that they be given an internship. When making an appointment, interns need to be ready to negotiate for what they want. A learning contract must be devised before the intern is hired. It is up to you to guarantee that you learn from the experience.

There are four types of internship positions:

Temporary Position

This is most often used. Student is hired to fill a full-time position temporarily.

Educational and Observational Position

Intern is an honored guest. A main goal of the internship is to provide a learning opportunity. The intern goes to executive meetings to observe a professional's work life.

Recruitment-Oriented Position

The organization provides training of skills in order for future recruitment. Interns are trained for a position. Intern activities and work performance are evaluated for future opportunities within the organization.

Project Oriented Positions

Interns work on projects set up to complete important and necessary work for the organizations. This type of position provides interns with the opportunity to see the results of their efforts. It also gives interns first-hand experience to contribute to an organization. It is an excellent format for setting up goals and objectives for an internship. ■

Conference Note Takers: Cindi Moor, Julia Harrington

Work Shop: Graduate School

■ Sandra Gregerman, Director of Academic Programs, University of Michigan School of Natural Resources

Ms. Gregerman started out by advising why and when you should not go to graduate school. If you don't want to look for a job; if you don't know what to do or where to go; if you are searching for a purpose; don't go to graduate school. It's likely that you will be unsure of why you are there.

If you know from experience in the work force or internships that there is something very specific that you'd like to do in the environmental field; if you know the kind of professional you would like to become, then graduate school is something you should consider.

At the University of Michigan School of Natural Resources, the average student is 28 and has had some kind of experience between his or her undergraduate and graduate study. Many have been in the Peace Corps, and several have had internships. Most have had some kind of experience that has helped them decide "what kind of career they want and the academic preparation they need to go on and be successful in the field."

Since the environmental field is so broad, and no one school is strong in all the different areas of specialization, it's impossible to recommend any one school. There are, however, some guidelines you can use to research graduate schools and increase your chances of finding a good match for you.

1. Start out by using your library resources. *Peterson's Guides* have listings of graduate schools and detailed descriptions of many institutions. Look at the cost, the kind of aid available, the location, and cultural amenities. Don't use the Gourman Report; "it is not reliable." Check specific college catalogs for an environmental section.

2. The best thing you can do is to talk to people who work in professions that you might want to enter. Where did they go to school? Where does their agency, nonprofit, or corporation look for

future employees? Where do they do recruiting? Do they tend to like people from certain schools? What kind of programs do they like?

3. Once you have an idea of the places that you would like to be, "it is *extremely* important to visit the schools" and stay with students. Talking with alumni is no substitute because programs are always changing in this dynamic field. The University of Michigan arranges extensive visits for prospective students. "Attend classes, meet faculty members, talk with current students, and read any publications they have."

Here is a list of critical questions that most prospective students ask Ms. Gregerman on the phone or during visits.

1. What positions do recent alumni hold? Since many programs have changed considerably in the last five or six years, it is important that you ask about graduates of the last two years.

2. Where do most of the alumni live? Are they placed nationwide or do they settle locally?

3. What is unique about the program? What are the program's strengths?

4. How many full-time faculty are associated with the area that you're interested in? How often do they teach? How accessible are they? Adjunct faculty can be important, too.

5. How many students are enrolled in the field you're interested in? What is the ratio of students to faculty in your area? How much faculty time will be available to you?

6. How much financial aid is available? This varies greatly from field to field. In some specialties, the faculty is doing a lot of research, and grant money is available. What is the likelihood of receiving financial aid? What is the financial burden likely to be?

7. What form does the financial aid take? Receiving a scholarship or fellowship is not always best; in some cases it's better to have a research or teaching assistantship to give you different kinds of skills that you may not already have. Those positions may benefit your career in the long term.

8. Is there a career resource center that can help you with placement? Are they experienced in internship and job placement in your field?

9. What is the community like? If you are making the transition from the work force back to school, this may be particularly important. Is it primarily a college town? Is it urban, rural, or industrial?

10. What is the potential for environmental activities in the community? Especially if you are in a field dealing with community involvement, it's important to know if you can try some of your ideas. Do the residents have a public participation orientation? Are there schools where you can try your environmental education ideas? Is there a recycling center?

11. What is the cost of living in the community? Will your whole stipend cover just your monthly produce bill?

12. What are the requirements of the program and do they match your eventual goals? There are usually several options: masters thesis, masters project, or masters practicum. If you are going into research, a masters thesis is a necessary credential. If you're interested in government or nonprofit work in which problem-solving is an important skill, then maybe a project or practicum would be more appropriate. Get the kind of experience that emulates what you eventually want to do.

13. How flexible are the requirements?...What is the rationale behind them?

14. What are the connections with the faculty and programs in other parts of the university?...Can you take courses in other programs? What are the other programs that students often go to for course work? Are there any restrictions, like a law school that doesn't open its courses to non-law students?

Those are some of the basic questions that are most important to ask.

Currently some of the top fields are:

- the hazardous materials and solid waste area;
- the ground water, water resources, and environmental engineering area;
- landscape architecture (the University of Michigan program has had 100% placement for its graduates);
- resource planning and policy;
- environmental communication;
- toxicology and environmental health (an increasingly important field);
- administration and fundraising (business and economics).

The most competitive areas are fisheries, wildlife, and forestry, the traditional fields. There has been a lot of competition for a while, but "there is a rumor that forestry may be opening up in a few years." Programs at several graduate schools are just being created in conservation biology and restoration ecology, and the job prospects in these areas are still unclear. The University of Michigan has both programs, and the University of Texas at Austin has a restoration ecology program.

Questions and Answers

Q *What are some good things to do when you visit campus?*

Talk with the students in the program. How happy are they with the program? What courses do they particularly like? Do they have any reservations about the program? Go to classes with your peers. Are there people who are inspiring? Dynamic?

Find out what kind of research and practical, "hands-on" opportunities are available.

Explore the community.

Q *How competitive is the admissions process?*

That varies with the program and the area. At the University of Michigan, a strong science background is extremely important for resource ecology, but not for some other areas. Most universities look at your GRE score and your academic record and don't weigh job experience as much.

Q *How can particular schools be assessed?*

Find out what alumni are doing and where they are. Ask professionals in the specialty about the reputation of the school. Find out who recruits at that school.

Q *Do graduate schools look at post-graduate academic records?"*

Yes. They look at transcripts from any place; any courses may count. In particular, if you changed directions from English to a science and picked up some science courses after graduation, then definitely make that known.

Comments from the Audience

A representative from Bard College added some of his thoughts to the discussion.

Look at the pedigree of the school. Has it changed in tone recently? Is the environmental program a forestry school outgrowth or does it have a liberal arts, interdisciplinary tone?

Where do you want to live after you graduate? Particularly in environmental studies you may gain some knowledge that is specific to the area and would help you get a job locally. For example, knowledge of local biota would be quite useful for environmental impact studies.

What is the history of the faculty? Find out about their relevant background. Where are their degrees from? What is their research in? What are their degrees in?

Another member of the audience from Montclair State College in New Jersey mentioned that there might be courses outside of your school that are open to you as a graduate student. Ask about other schools in the area.

In closing, "the more you shop around, the better off you are. Happy hunting." ■

Conference Note Taker: Cordelia Pierson

Work Shop: Job Search Resources & Strategies

- Andrea Halleck, Regional Director, The CEIP Fund, Inc., Pacific Northwest
- Carol Shaw, Program Coordinator, The CEIP Fund, Inc., Great Lakes

Editor's Note

"Resources and Strategies" was originally presented as two separate workshops at the conference. However, because of their similar content they have been combined into one summary. Ms. Halleck handed out a listing of resources for the environmental job hunt. This listing can be found in the appendices.

Ms. Halleck started her presentation by telling the audience that the first step in beginning a career is to define your interests. In order to better focus your career objectives she suggested that the participants ask them selves the following pertinent questions: How do you like to spend your time? With people? Doing research? Field work? Analysis? Lab? Educating? Planning? Thinking about these at a macro level facilitates your job search planning.

What aspects of environmental issues draw you? Waste management? Natural resource conservation? International field? Water Quality? It is necessary to define your passion.

Peripheral career concerns. e.g. how much do you value control over your time? Often government work can be by the clock, whereas consulting work may require ten to fifteen hours a day. What is your definition of prestige, how important is a prestigious position?

Consider salary and benefits. Some positions might pay well, others may require you to have a second job to survive.

How important is challenge or the importance of having access to state-of-the-art technology?

What about growth potential and positioning? Where do you want to go now and five or ten years from now? How is a particular company, nonprofit organization or government career going to help you get there? The growth potential of the company will affect your own ability to move within the company and from the company. Look to meet people that interest you. Try to focus on the issues that move you, that you are passionate about. Is a job narrow and deep, or full of variety and dealing with a wide range of issues?

Plan your job search. Define your field and your potential contribution to a specific organization. Explain why you feel that you

should at least get an interview for a position you desire. Essentially, you must market yourself. Ms. Shaw explained, "Finding a job is like selling a product and you are the product."

Both Ms. Shaw and Ms. Halleck stressed the importance of networking. Ms. Halleck urged participants to use an informational interview any time they could. She explains, "who you meet often determines where you go. Look to meet people that interest you." Ms. Shaw explained that the networking process can take a long time. On an average a job search takes about six months. In the mean time it is advisable to take a part time job.

During the search process, it is advisable to lean on family and friends especially because rejection hurts. Keep in mind that eventually everything will come together. It is not necessary to find your career with your first job. Most people have at least three different careers in their life.

To prepare a resume it is not important to state an objective. Make a resume that is indicative of your career and put your objective in your cover letter. In the resume put education, work experience, summer research projects and volunteer work. Include personal information if you want, as it is not legally required. Neatness and a well written cover letter and resume are very important.

It is useful to let others know that you are looking for a job, as most jobs are not advertised, word of mouth information can be very helpful. Informational interviews are often held two to three months in advance. It is advisable to meet an expert, listen to his advice and make sure you send him a thank you note. It is also useful to read news papers and trade journals. The majority of jobs go to people who are reasonably aggressive. Punctuality for the interview, appropriate dress and a calm posture during the interview can not be overlooked. Follow up the interview by sending a thank you note. ■

Conference Note Takers: Neal G. Walker, Menoj Raman

Environmental Career Articles

The Environment is the Future: Career Opportunities in the 1990's

- Maureen Delaney, U.S. Environmental Protection Agency
- Clarice Gaylord, Ph.D., U.S. Environmental Protection Agency

In the 1972 United Nations Conference on Human Environment in Stockholm, 130 nations solemnly acknowledged a mutual obligation in maintaining a livable global environment. This expression on a global scale was the result of a growing awareness that 5 billion people completely depend for survival on the planet's thin veneer of fragile, interdependent resources. Much has been done since 1972. Some important measures have been implemented. We have recognized and taken some collective steps to mitigate the stratospheric ozone danger. We have awakened to the greenhouse effect. But we are still functioning in the reactive mode. New environmental problems with global consequences have surfaced faster than problems have been resolved. So far we have only seen the tip of the iceberg of possible global environmental problems.

The increase in environmental awareness is more than a trend, the environment is an issue continuously gaining importance in peoples lives, politics, science and technology. It is widely recognized that our scientific discoveries have enhanced life, but too little thought has been given to the second- or third-order consequences of our actions. We have failed to anticipate that the environmental modifications accompanying our actions have a global impact on human health and welfare in both direct and indirect ways, as well as on generations to follow.

In Europe, the "Green Wave" has changed the face of politics, Green Populism has made the environment one of the most important issues in politics. In the United States, Non Governmental Organizations are increasing their lobbying and educational activities, promoting "grass-roots consciousness". Concern has moved from debate to action in response to the environmental realities which we all must face.

This increasing environmental concern is reflected in the job market. The trend towards green thinking has resulted in an expansion of job opportunities in areas such as the clean-up and protection of the environment and in all sectors of our economy. This is reflected in the Federal government's anticipated needs for the rest of this century. In a recent study, "Civil Service 2000," the U.S. Office of Personnel Management predicts that the total number of federal employees is unlikely to grow significantly in the coming years. Yet,

the U.S. Environmental Protection Agency (EPA) has and is still experiencing a steady increase in its workforce growing from 5,000 employees at its inception in 1970 to over 16,000 employees today.

Careers With a Future

But where will the jobs be? What should one study? Is there a need for special training? Environmental careers are diverse and dynamic. There are a wide range of fields that are constantly changing. Opportunities exist for people with many different educational backgrounds and skills. The fact is, the opportunities for meaningful and rewarding careers in meeting our environmental goals will be as diverse as the environment itself. There will be an expanded range of opportunities in all skilled and professional areas generated by legislation as well as grassroots action. One employment trend is quite evident, available jobs are shifting to more complex technical skills and requirements and more will be white collar in nature.

Career opportunities range from media driven research work in air, water, pesticides and toxic substances, and solid waste to site specific challenges which require integrated approaches. One hazardous waste site project may require the professional services of a cadre of professionals such as engineers, hydrologist, toxicologist, heavy equipment operators and administrative support. Moreover these opportunities will exist in all employment sectors - corporate, consultant, government and nonprofit.

The forecasts in the Department of Labor's *Workforce 2000* gives a clear picture. There will be expanded opportunities in all the core occupations which will be needed to meet the environmental issues in the next decade.

Occupation	New Jobs	Rate of Growth
Lawyers/Judges	326,000	71%
Natural, Computer Mathematical Sciences	442,000	68%
Engineers/Architects	600,000	41%
Administrative Support	3,620,000	20%

Workforce 2000 also predicts that by the 21st Century, 85 percent of new entrants into the labor pool will be women, minorities and immigrants. Up to now, these groups have historically been under represented in these core fields, especially in science and engineering. White males, considered to be the mainstay of the Nation's workforce will comprise only 15% of the future labor market. Therefore, the ability to recruit, retain, develop and promote the best talents from these under-represented groups will be crucial to meeting the diverse needs on the environmental front.

Environmental careers have been singled out by many in the business of predicting the job market as being on the rise into the next century. At the Environmental Protection Agency we have seen

an increased commitment to the environment during the late 1980's as the Agency approaches its 20th Anniversary, as the Nation focuses on the re-celebration of Earth Day and Congress prepares to ponder the elevation of EPA to the cabinet level. We understand the regulatory work that still is to be done and the implications of pending legislation, and we have witnessed the growing grassroots activity, so we do know that there will be a continuing need for skilled professionals in all aspects of environmental protection and preservation. For example, Odum Fanning in Opportunities in Environmental Careers, estimated that in the mid-70s there were approximately 10,000 engineers working in environmental projects and anticipated that by the mid-90s there will be over 30,000 engineers involved in finding solutions to environmental problems. With growth in our common commitment to the environment will be opportunity

The employers of these skilled individuals will be as diverse as the many areas of environmental protection that need to be covered. As an illustration of the potential the CEIP Fund, Inc. "Minority Opportunities Study 2" cites:

> "... since the formation of EPA...there has been an explosion of professions to conserve, protect, monitor, test, litigate and research the environment. The passage of the Superfund Act alone has generated thousand of jobs in corporations, government agencies, consulting firms, nonprofit organizations and community groups."

At the industrial level, environmental opportunities increase as more and stricter environmental regulations are created that industry has to comply with. A growing number of smaller firms will be addressing specific issues such as asbestos abatement, recycling, and facilities design. Municipal and federal governments will require talented individuals to draft regulations, design enforcement programs and lead efforts in education.

Careers by Program/Emphasis Focus

The clean-up and protection of the environment will continue based on existing legislation, such as the Superfund legislation, Clean Water Act and pending legislation such as the current debate on the Clean Air Act and the establishment of a Center for Environmental Statistics, and there is still much to be done. Some of the areas which promise to be important growth areas for opportunities can be defined by the current program emphasis being designed at the Environmental Protection Agency. While the following by no means is an exhaustive review of the potential careers in this exciting area it does represent some of the major activities to be addressed in the decade of the 90's.

Research and Development

Research and development are essential to all processes involved in addressing the environmental issues during the next decade. In order to maintain public trust in EPA's regulatory actions and decisions we must ensure that the highest level of scientific support exists. Scientists and engineers interested in research and development activities will be rewarded for their studies by excellent prospects for challenging work. EPA's R&D program will be significantly increased over the next few years. The commitment to R&D will continue to grow because of the benefits such research will have on the overall health of the population, the economy and the environment.

A large portion of the research activities in the Core Research Areas (see box) will be federally funded. The EPA has 12 facilities across the United States responsible for in-house research. Nevertheless, a significant portion of the research is conducted on university campuses funded by grants or cooperative agreements, or conducted by private laboratories under contracts. In addition, industry also has a growing commitment to research. The forecast for individuals with the necessary skills for research and development efforts is outstanding since there is a overall deficit in skilled individuals to available jobs.

Core Research Areas

Sources, Transport and Fate	Exposure Assessment
■ Characterizing sources discharges	■ Total exposure assessment and methodology
■ Transport, conversion, and interaction in the environment	■ Personal monitoring
■ Models for predicting form and concentration of pollutants	■ Models predicting exposure
■ Methods for anticipating future environmental problems	■ Biological markers of exposure

Ecological Effects	Health Effects
■ Assessing risks to ecological systems	■ Neurotoxicity
■ Defining the status of ecological effects	■ Reproductive toxicity
■ Detecting trends and changes in ecological systems	■ Respiratory systems effects
■ Predicting changes in ecological systems	■ Carcinogenicity
■ Biological markers	■ Epidemiology

- preventing pollutant generation
- Combustion and thermal destruction
- Separation techniques
- Exposure avoidance
- Education and technology transfer
- Chemical treatment of concentrated wastes and residues

Especially in the research field, engineering and science degrees will be highly valued. To obtain a job as a researcher, a degree ranging from a bachelors to Ph.D.s will be needed. Clearly those with advanced degrees, or experience will have ample opportunities to select the job they prefer.

Pollution Prevention /Reduction

Current activity in addressing environmental concerns has been targeting end-of-pipe solutions, but the future of our environment will depend on increasing efforts in pollution prevention and reduction.

In order to be successful at protecting human health and environmental quality all elements of our society must take steps to prevent or reduce risks. State and local governments, large and small businesses, and individual families must act to reduce the wastes and contaminants generated everyday. Some examples of the scope and level of activities to be addressed are: at the industrial level, manufacturers will be looking to, or will be regulated to, redesign production processes to control all waste products, especially hazardous wastes; at the grassroots level, communities will be implementing recycling programs; and, municipal level governments will need to plan education campaigns to develop voluntary compliance programs.

There will be job opportunities at all levels to transfer technology, share common solutions, and educate the public of individual and collective responsibility in reducing the risks. Careers will exist for those with skills in information transfer, public policy, education and a basic knowledge of environmental and ecological concepts. There is in fact new legislation, National Environmental Education Act, which supports the creation of an Office of Environmental Education which would stress the importance of education in the 1990's.

Environmental Law

The regulatory nature of environmental policy to date is the framework for media addressed environmental controls such as the Clean Water Act, Superfund legislation, Resource Conservation and Recovery Act (RCRA), and Clean Air Act. The growth in opportunities in environmental law reflect the growing complexities of the regulations and the increased emphasis on enforcement. At EPA, attorneys make up the fourth largest professional occupation in our workforce. The regulatory activity has spawned opportunities for

attorneys in the private sector as well, and there is always a need for lawyers in public interest and non-profit groups.

The legal profession, as many already know, has become highly specialized with some larger firms employing lawyers with expertise in just one aspect of a given regulation. The individual who combines a law degree with a scientific or engineering background will be especially sought after.

Global/International Issues

The nature of environmental issues is that they defy national borders. The care and preservation of the earth and its atmosphere is a common global concern. Internationally, the greenhouse effect, the depletion of the ozone layer, and the global ecological crisis are now recognized as being among the most serious issues facing individual countries and the world. There will be, during the next decade, a growing commitment by nations to address these shared concerns through bilateral and multilateral agreements. The up-coming Global Warming Conference is evidence of the magnitude of the international cooperation in facing our shared global problems.

Opportunities will exist for environmentalists with scientific and engineering backgrounds with excellent communication and interpersonal skills to be part of the international teams which will negotiate with our neighbors around the world.

The Career

There is no doubt that one of the most promising sectors for career opportunities will be in meeting the challenges before us in saving our precious resources. Choose your career carefully and wisely.

Before choosing careers in the environmental arena individuals should consider some very vital questions: What do they enjoy doing? What are they good at? How much education do they plan to get? How much can they invest on training? The diversity exists for every one interested in the environment to aid in the solutions for today and tomorrow. Select the track which will lead you to a career you will enjoy, for then you will be your best. ■

Maureen Delaney is currently Director of the National Recruitment Program at the US EPA in Washington, DC. Prior to coming to EPA, Ms. Delaney had been with the Peace Corps for eight years in a variety of positions including Director of Volunteer Placement.

Clarice Gaylord is currently Deputy Director of the Office of Human Resources at The US EPA in Washington, DC. She has been with the EPA since 1984 in a number of positions ranging from Director of the Research Grants Program, Director of the Policy and Management Staff in the Office of Ground-Water Protection. Dr. Gaylord implemented EPA's Minority Summer Intern Program. Dr. Gaylord received her doctorate in zoology from Howard University in 1971.

Environmental Professionals — People For All Seasons

■ Robert F. Ehrhardt, National Association of Environmental Professionals

As president of the National Association of Environmental Professionals (NAEP), I have been asked many times in the past year, "what is an environmental professional? What is it like to be an environmental professional? What careers are included in the environmental profession? What sort of academic training is recommended for those wanting to join the environmental profession? Where is the profession headed as we enter the decade of the 1990's? And how will it be different in the year 2000 as compared to today?"

What (or who) is an environmental professional? In my estimation, an environmental professional is one whose work focuses on the human or natural environment and who, like true professionals in any field, has mastered a particular body of knowledge and is dedicated to the ethical application of that knowledge in all their work.

What is it like to be an environmental professional? At different points in my career I think my answer to this question would be quite different. Right now, for example, I cannot imagine a career with more exciting or complex challenges, that is in more demand or respected by the population at large. Environmental work is increasingly recognized by the public as critical to the creation and maintenance of a safe, secure and spiritually enriching "good Life". The environmental profession is in great demand — whether as an employee in just about every sector of the economy, a technical resource for community groups, or as a guest lecturer at your local public school. This was not always the case, however. It was not long ago that the environmental profession took a back seat to many other professions in terms of desirable employment or public esteem.

In fact, to the public, there were times when the environmental professional was more of an annoyance than a resource. The energy crisis years of the mid-1970's and the economic recession years of the early 1980's were two periods when the profession struggled to establish and maintain itself in an atmosphere when other national priorities were perceived as more important. Having experienced both of these relative low points, helps me appreciate all the more how vastly different the world is that environmental professionals will face in the 1990's and beyond.

What careers are included in the environmental profession? Rather than attempt a comprehensive listing, I will address this question more qualitatively. Just about any career you can think of could have an environmental analog or component to it and thus qualify as an environmental profession, e.g., environmental *lawyer*, environmental

engineer, etc. There are, of course, the "mainstream" careers, traditionally thought of as comprising the profession, e.g., ecologist, biologist, land use planner. Pick your favorite aspect of the natural or human environment, and it will most likely have a career speciality devoted to it. For example, if water resources are the love of your life, you can choose to pursue a career as hydrologist, aquatic biologist, limnologist, stream chemist or oceanographer, among others. There is a similar diversity of opportunities available if the land or air media are more to your liking. You can also pursue a career in public health and its relationship to environmental influences — environmental toxicologist, health physicist, or epidemiologist are just a few of the many career opportunities in that area. While I have so far emphasized the environmental career opportunities in the physical and life sciences and engineering, there are other types of career opportunities as well. There has always been a need (which, in my view, will only continue to grow) for writers, teachers, political scientists, public administrators, management scientists, policy and regulatory analysts, and others with a specialty in environmental subjects.

Academic training requirements for environmental professionals directly mirror the discussion of careers and disciplines above. As with other careers, those with advanced degrees will tend to have relatively more and better paying career opportunities, but there will be a need for professionals with all levels of academic training. Regardless of the specific professional niche chosen, those with at least some formal training in the basics of environmental science and engineering will be at an advantage. Nevertheless, this is not to say that technical specialists will be all that is needed in the environmental profession of the 1990's. The environmental challenges of this decade will also require analysts, managers, leaders and decision makers who have a well balanced background, in the humanities and arts as well as the sciences, who can act as integrators and communicators of complex information and who can provide leadership in the development of public consensus on complex choices in environmental management and protection.

Where is the environmental profession headed and where will it be in the year 2000? It is a cliche by now to observe that most, if not all, of the "easy" environmental challenges have already been tackled in previous years and decades. All of the "low hanging fruit" has been picked from the trees, so to speak, and the challenges for environmental professionals now and in the foreseeable future will involve difficult, many times painful, choices and trade offs between environmental goals and other social priorities. Environmental programs of government will be in fierce competition for increasingly scarce resources with other initiatives perceived as high priorities by the public, e.g., improved elementary and secondary education, long term health insurance, etc. The environmental professional in the 1990's will spend an increasing amount of time studying, analyzing,

managing, and communicating about risk — what is an acceptable risk to human health and the environment? Who should decide what is or is not acceptable risk? How much uncertainty are we willing to accept in the data on which we base our risk management decisions?

By the year 2000, I expect that environmental professionals will be operating in a world in which their life's work is recognized as one of the foundations of day to day operations in industry, government and other sectors of the economy. Recognizing my own particular bias, I believe that some of the most dramatic changes will be made in industry where environmental concerns will be fully integrated in strategic planning and business development decisions from the beginning of the process and not treated as a constraint on implementation after all the "important" decisions have been made. By the year 2000 the environmental profession will be comprised of a larger percentage than ever before of individuals whose entire academic work experience and academic training has been "environmental". This will further strengthen the identity of the profession and cohesion among those in it, while maintaining the multi-disciplinary and diverse character that makes the environmental profession such a stimulating and broadening experience.

It should be obvious that those choosing to join the environmental profession could not have chosen a better time to do so. The demand for their skills talents and expertise is high and growing. The financial rewards are improving and the rewards in terms of professional recognition and satisfaction have never been better. We can safely say that environmental concerns are not a passing fad; that they have received mainstream status as a fundamental societal priority. This should not make us smug or complacent. Public expectations of the environmental profession are high, and we must not disappoint. The challenges facing us are formidable. I am confident that we as a profession will be equal to the task. ■

__Robert Ehrhardt__ is currently President of the National Association of Environmental Professionals. He has a Bachelors degree in Chemistry and Masters degree in Public Policy. He has been involved with environmental policy for sixteen years working for government, academic institutions, consulting firms and most recently in industry. He has also been a member of NAEP for eight years.

Being an Environmental Lawyer in the 1990s: Saving Our Planet the Legal Way

- John Adams, Natural Resources Defense Council
- Nina Sankovitch, Natural Resources Defense Council

You're in law school or thinking about it. Your goal: to become an environmental lawyer and join in the fight to save our planet. Wonderful. Your timing couldn't be better. The 1990s promise to be the decade of the regeneration of our planet, and across the public and private sectors forces are strengthening for the battle. But to be an effective soldier, you have to find the environmental job that can offer the challenges and the rewards that will keep you going with energy and enthusiasm. There are three basic approaches to being an environmental lawyer, and each approach offers different rewards, provides a different working atmosphere and emphasizes different skills. All three approaches will flourish in the 1990s. It is up to you to find the right approach. The goal of this article is to help you in assessing the alternatives available in environmental law and in evaluating your own needs. The process is simple: you must both explore as many of the different approaches as possible both before and during law school, while at the same time assessing where you feel most comfortable. For example, you should consider whether you want to spend your time working with government or in private practice, whether you'd like to devote yourself to research and writing or field work and compliance monitoring, whether you prefer to work in developing legislation or using existing laws in litigation, whether you prefer behind the scenes work or fighting on the frontlines, and whether you'd like to work in a traditional legal setting or would like to work in an innovative atmosphere. You probably don't know the answers to these questions now, but by exploring alternatives you'll begin to narrow the field.

There are basically three approaches to the practice of environmental law: (1) working for the enforcement of environmental laws, (2) counseling compliance with environmental laws, and (3) defense work, including both defense of accused polluters in civil and criminal actions and litigation over clean up responsibilities. The first avenue is the particular domainof non-profit private organizations and government agencies. The second and third avenues are usually

pursued through private practice. No matter which path is chosen the need for lawyers is increasing as concern for the environment reaches new heights. The environment is the hot field now, across the professions, and opportunities for lawyers abound.

The first approach to working as an environmental lawyer is working for the enforcement of environmental laws. This approach focuses on current and proposed legislation for protection of the environment, and uses public education, congressional lobbying, and litigation to bring about environmental regeneration. Such an approach is pursued either through working with a non-profit organization or working in government. It is a general rule that private, non-profit organizations are among the lowest paying environmental jobs, at least at the outset. However, the advantages to working for a non-profit are numerous. Because the constraints and bureaucracy of government are missing, work in a non-profit can be non-traditional, aggressive and indeed highly innovative. The level of individual responsibility and commitment is high, making non-profit work an inspirational, self-motivating experience. Each lawyer in such organizations is typically responsible for specific goals of enforcement, such as monitoring of the urban environment or cessation of ocean dumping of sludge and hazardous wastes or compliance with air quality standards of a specific region. The methods whereby such goals are pursued ranges from public education on specific issues to congressional lobbying for proposed legislation, from aggressive litigation against polluters or against government agencies for not enforcing/complying with applicable laws and regulations to cooperative advisory work with public agencies. Thus, working for a non-profit organization offers opportunities in litigation, investigation, research, writing, and public speaking. Such work can be high profile and demands a strong working knowledge of current environmental issues. You must be accessible to the public at large, assertive with the press, and aggressive with government agencies responsible for environmental protection.

Enforcement of environmental laws can also be pursued by working with a government agency, either on the local or federal level. There are two components to government enforcement of environmental protection laws. First, regulations and standards for environmental protection, consistent with the laws, must be promulgated, and polluters and pollutants must be monitored. This work could be described as the "administrative" side of government's protection of the environment, and is performed on the federal level by the EPA and on the local level by the departments responsible for public health and the environment. This type of work involves interaction with scientists, the regulated community, and the public at large, including private environmental groups. In addition to formulating regulations to affect compliance with environmental legislation, the government lawyer may work on specific projects out

of which new laws and protection programs arise. Because of the required public comment on such agencies' work, the government lawyer must be able to communicate well, to disseminate information, and to respond to public inquiry. Unfortunately, all these duties must be carried out within what is often an inadequate budget. This type of work offers opportunities for public advocacy, research, writing, and formulation of new programs.

The second component to government practice is the bringing of enforcement actions, and civil and criminal actions, against polluters who fail to comply with environmental laws, standards, and regulations. This litigation is handled by the Department of Justice on the federal level and by the state attorney general's office on the state level. Cities also typically have environmental lawyers within their legal departments. This type of government work offers extensive litigation experience and does not involve the day-to-day protection work of monitoring, investigation, or program implementation. The litigating lawyer works closely with the "administrative" lawyers who have documented the violations, yet is also responsible for executive policy on each enforcement action. For example, the Governor may advocate strong penalties for a certain type of polluter yet may advise leniency in another case. The government lawyer who has documented the case may be at odds with such policy. The litigating lawyer must be able to respond to executive interests while at the same time maintain a good working relationship with the other lawyers.

Thus, the government lawyer, whether "administrative" or litigating, struggles with the difficult task of working within a traditional and often frustrating bureaucracy and being responsible for a wide range of goals with a limited budget. Nevertheless, there are benefits to being a government lawyer. For example, the traditional framework of government legal practice provides structure and authority to environmental advocacy: because you are the designated and familiar enforcer of environmental laws, regulated entities are more willing to work with you in monitoring compliance with environmental laws and in implementation of new protection programs. Indeed, under the current wave of environmental leadership in government, public agencies have regained their force as protectors of the environment and can break new ground in regulating industry. As with non-profit organizations, young lawyers are given responsibility in managing their own cases and projects. In addition, government salaries are typically higher than non-profit salaries.

The second approach to environmental law, counseling compliance with applicable laws, is pursued through working for a private firm or for a company. Companies are hiring inside counsel to advise them on the issues. Most companies will not hire in-house counsel straight out of law school, but prefer to hire experienced lawyers from firms. More and more firms are putting together environmental

departments in response to the raised levels of corporate clients' concern with the environment. This work requires an in-depth knowledge of environmental regulations and of the procedures for compliance. Litigation or innovation in protection are not the focus of the work, but rather the specific needs of the clients must be catered to. Some firms also represent their clients' interests in the legislative arena, thereby offering the opportunity for lobbying and administrative appeal work. Typically, however, young environmental lawyers in a private firm direct most of their energy to research and writing memos counseling clients on how to comply with a myriad of regulations. There will be little chance for the young lawyer to take on full responsibility for a case. Thus, the environmental lawyer in this situation is less of a dynamic force for environmental protection than the non-profit or government lawyer. There are, however, benefits to private practice. These include a high level of educational supervision and feedback on work product, the rewards of hands-on implementation of compliance, the possibility of legislative input, and a high salary.

The third approach to environmental law is defense work. Defense work involves the defense of polluting companies against the government, their insurers, their shareholders, and private citizen suits brought by non-profits. Defense work provides litigation experience and can involve investigative work. This type of defense work can be lucrative but it is questionable if it can help save our planet. However, another type of defense work which promotes cleanup of the environment is the rapidly growing field of insurance coverage litigation: who pays for the cleanup of hazardous wastes and other environmental messes. In this field, the cleanup itself is not in question; the issue is who has to pay for it. Many private firms are increasing their work in this area, as the cleanup of Superfund sites increases. The benefits of such work include litigation and investigation experience, the supervision provided by a private firm, a high salary, and the reward of getting pollution cleanup funded, albeit after years of litigation. As with all private firm work, the young defense lawyer is not given a lot of responsibility and must focus on the needs of the client, rather than on overall solutions to cleanup problems. Defense work is a way to learn about environmental law, including compliance, enforcement, and legal problems of cleanup, and thus can be a step in the direction of more actively pro-environment work.

Before deciding on which approach to environmental law is right for you, a number of factors must be weighed and a variety of the approaches should be explored. First, think back on your experiences in college and your experiences thus far in law school. What have you enjoyed most: research, writing, public speaking, debate, operating behind the scenes or at the forefront? Examine where your strengths lie, whether in working with people, creating new and innovative ways for going about things, organizing others, or

following through on defined goals. Another factor that must be considered by law school graduates is future finances. Determine what your financial needs are going to be, what sort of sacrifices you are willing to make, and what sort of loan-forgiveness programs your law school has. If you are not yet in law school and think you may want to pursue a job in the non-profit or public sector, check into the programs set up by various law schools whereby law school loans are forgiven if a low-paying non-profit or public sector career is chosen.

Next, begin exploring the alternatives. During the school year volunteer at a local non-profit, obtain an internship with a government agency, enroll in an environmental clinical program. You should also explore working on your school's environmental law journal. During the summer explore other approaches: try one summer with a government agency or a non-profit organization, try another summer with a private firm. Many of the non-profits have funded summer internships, as do some government agencies. If you have graduated from law school and are working for a private firm, inquire as to the pro bono opportunities for environmental law or the possibility of doing environmental work for a client. Attend environmental law conferences, advertised in EPA's various newsletters, local Bar notices, and the ABA journal. Be aggressive in meeting environmental professionals at conferences and in school, ask questions and remember names and organizations. The more you know about opportunities available across the spectrum of environmental law, the greater chance you have of finding the job that you will enjoy.

Finding the job you will enjoy is the key to being a successful environmental lawyer. The environment is a fascinating field of work, especially now as it has regained the spotlight of legislative and public interest. But environmental law work is demanding. As is the case with most fields of legal expertise, it requires mastering complex legal documents, such as laws, regulations, consent agreements, enforcement orders, policy statements, etc. In addition, environmental work requires understanding the scientific information which makes up the facts of each case and each problem. It is the facts of the cases and problems that make the work so interesting, yet for most lawyers scientific "stuff" is hard to master. If you can find the environmental job that most fits your strengths and ambitions, you will have the energy and the confidence to tackle the difficult legal and scientific concepts. But if you throw yourself into an arena where you do not belong, you will become frustrated and feel unequal to the demands of the job. For instance, you may feel during law school that the purpose of law school is to become a courtroom advocate, a litigator for the environment. But in reality your strengths may lie in researching environmental issues or in critiquing proposed legislation or in educating the public about pesticides, sewer regulations, or global warming. Go where your

strengths lie and you'll do the most good for the environment.

Doing good for the environment is the best part of being an environmental lawyer. As an environmental lawyer, you have the opportunity to make a big impact with your work, even when you must focus on the needs of a particular client. By getting the law clearly defined and implemented, through lobbying, monitoring, counseling, or enforcement, you are making a step in the direction of a cleaner planet. No matter which approach is chosen in pursuing your career as an environmental lawyer, the future promises challenging and rewarding work. New, tougher environmental legislation is being promulgated and enforced, thereby increasing the need for lawyers across the board to formulate the legislation, to lobby for or against it, to monitor compliance with it, to enforce it, to defend against the enforcement actions, and to litigate the issues of who pays for what and when. Not only will environmental legislation increase but governments will also provide more funds for monitoring and enforcement. Contributions to non-profit organizations are on the rise, which could result in more of such jobs being available and perhaps higher-paying. Law firms are adding environmental departments and companies are hiring their own in-house environmental specialists. Thus, no matter which approach is taken, the opportunities are there. The 1990s is when our planet may receive the most support it has ever inspired, and you are there at the moment of highest attention, funding, and interest. So go to it, do your research on the alternatives, find your niche, and flourish. Because if you succeed as an environmental lawyer, we may all succeed in saving our planet. ■

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Prior to his work at NRDC, Mr. Adams was with the firm of Cadwalader, Wickersham and Taft and served as Assistant United States Attorney for the Southern District of New York. Currently he is President of the Open Space Institute and an adjunct professor of law at New York University.

Mr. Adams is also a director of the World Resources Institute, the Hudson River Foundation for Science and Environmental Research, and the Winston Foundation for World Peace, ass well as a member of Governor Mario Cuomo's Environmental Advisory Board.

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International Environmental Protection

■ Thomas Fox, World Resources Institute

International and global environmentalism is *a boom area* for prospective employees. It will remain so for at least the next generation of job seekers. Why? There has long been popular interest and concern for the persistence of poverty in developing countries; and, more recently, there has developed a constituency in this country for relating that problem of poverty to the persistence of population growth. People give money to these causes; and many young people seek employment in these fields. But, we are now learning that what is popularly called "the environment" is closely related to these other issues of longstanding concern to Americans. We now use phrases like "natural resources management," or "sustainable development." These terms reflect an increasing awareness that people's well-being inevitably depends upon the natural resource base: the wealth of the soil, the abundance of clean surface water, the presence of ample precipitation, the presence of vegetation and trees, the abundance of mineral resources, the cleanliness of the air, etc. Some of these resources are limited, or at least not truly renewable, lending all but more urgency to our attention to the environment. In short, the environment has become an international issue of the greatest magnitude.

Symbolized perhaps by the rainforests of the Amazon, Central Africa, and some Southeast Asian countries, the attention being given to the environment and to the natural resource base certainly provides new opportunities for job seekers. Some will have opportunities to relate the environment to economic development; for example, we need people to factor the natural assets of soil and water, as capital, into conventional economic decision-making. Some will protect or preserve the environment for the current inhabitants of the land; these will be park rangers or ecologists. And still others will make environmental assessments and impact studies, to help planners and developers avoid the kind of environmental disasters caused by outside events or the economic ambitions of humankind — floods as well as dams or timbering operations.

Certainly too there will be all kinds of program areas and vocations in which one could specialize. Some are important job markets in this country already, like industrial pollution or waste management. Others, however, are more endemic to developing countries, like watershed management, coastal resources management, or sustainable agriculture; or the wise management of forest resources, the use and protection of biological diversity, and so forth. These

program areas will require engineers, chemists, ecologists, foresters, biologists, and agronomists — the more technical and scientific field. But, the relationship between natural resources management and conventional economic decision making will also require a whole new breed of "resource economists." Lawyers are needed to review existing legislation and policies, such as land title and land tenure. Anthropologists need to study the relationship between indigenous peoples and the forests in which they have lived for centuries. So, the field is wide open.

It is also fair to say that there will be all kinds of employers available to people seeking entry into international environmental protection. As implied above, large corporations — be they timber or mining interests, oil exploration companies, agriculture corporations, etc. — will need both scientific and management expertise in these fields. Research, for example, into the best uses of the unbelievably rich variety of species in the Amazon forests remains a wide open field. Not surprisingly, pharmaceutical companies are sending researchers in the constant search for new drugs to combat illness and disease. This is one of the key arguments used to protect biological diversity in the rainforests, because of the presumed value of many heretofore undiscovered biological species.

Certainly the public institutions working in developing countries (now including Eastern Europe) will need the same array of expertise. These include international institutions like the World Bank, the Food and Agriculture Organization (FAO), or the United Nations Environment Program (UNEP), as well as our national government agencies like the US Agency for International Development (AID), the Peace Corps, and the International Division of the Environmental Protection Agency, soon to be a full cabinet department!

Then too there are the non-profit organizations — including universities which, along with multi-national corporations, dominate the research field. Some non-profits have been working solely in the environment field for some time, like the World Resources Institute, the Audubon Society, the World Wildlife Fund, and the Natural Resources Defense Council. Others, like CARE and Save the Children are relatively new to the natural resources management field; but they too can be pursued by someone seeking a career in this growing industry.

What employee characteristics are some of these organizations looking for? It is, of course, hard to generalize about the priorities of such a wide range of organizations and types of employers, but a few qualities stand out: a commitment and powerful motivation to advance the program or cause of environmental protection or natural resources management; the capacity to derive satisfaction from the task and from accomplishment, since financial rewards, particularly in the government and non-profit sectors, rarely equal those of other sectors; a well-developed analytical ability; and the capacity to motivate and direct oneself. Each of these attributes is

particularly essential in a field where staffs are usually over-extended, resources are limited and uncertain, and management systems are handicapped by the fact that results are often not neatly measurable. (How many new trees, for example, will make an appreciable impact on the greenhouse effect?) It is, for instance, almost a truism that non-profits bite off more than they can chew.

The above are personal characteristics common to many international endeavors. In the field of environmental protection and natural resources management, however, there is an obvious particular need for both technical, and scientific and sociological expertise to bring together the needs of people with the carrying capacity of the planet on which we live. Scientific and technical expertise is in short supply, and is sorely needed.

Where to start? First hand experience in the field, language ability and aptitude, and demonstrated cross-cultural sensitivity are requirements common to almost all of these positions. For instance, the Peace Corps, which regularly produces a few thousand such people each year, has dramatically changed the job market for young people seeking a career in Third World development. Returning Peace Corps Volunteers dominate the staff rosters of non-profit organizations and government agencies working in international programs. It is hard for a generalist with an M.A. in international affairs and marginal proficiency in French or Spanish to compete with an equivalent generalist who is fluent in French or Spanish and who has spent two years practicing directly the development problems of the Third World.

Beyond the acquisition of technical expertise and formal degrees, and the acquisition of a second or third language and relevant overseas experience, let me also stress that employers will look for evidence of environmental concern here at home. To what degree has someone demonstrated both sensitivity and activism (in the benign sense of that word!) in the environmental questions and issues of the United States.

Then get into "the network." Through a process of referrals, many individuals seeking jobs get passed on from person to person, learning the field and organizations as they go. Particularly in the non-profit organization culture, people are willing to spend a half hour chatting with a job seeker, even busy heads of big organizations that have no vacancies at that moment. So, resumes and other formal tools of the application process are not the only important elements in a job search, although they are necessary prerequisites to even this networking process. (To me, it is not surprising that people already in this field spend so much time counseling prospective newcomers. People in this business share a powerful commitment to the cause. Encouraging like-minded younger people to enter the field is simply their further investment of themselves in the broad field of international environmental protection.)

And what of the future? It is clear to me that this boom area for job seekers will continue. The link between the environment — the natural resource base — and humankind's well-being is increasingly understood; the issues are totally intertwined. Were I seeking a job in this field today, I would look particularly to the problems of the forests and of their ability to provide continuing sustenance to people in and around them. I would explore the field of sustainable agriculture, to ensure that the productivity of land is not so depleted that it can't produce the food on which we depend. I would concentrate on the critical need to find solutions to providing energy, without depleting the very sources of energy, and/or I would become an energy efficiency expert. This latter is particularly key given its relationship to the current engines of economic growth, like the consumption of oil, coal, and natural gas, all in limited supply, all pollutants in one form or another, and all contributors to global warming. Finally, in addition to exploring opportunities in and on behalf of the Third World, I would learn some Russian, or Polish, or even Albanian.

It's a wide open field. And it will be in the next century. ■

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Pollution Prevention: The 1990's Alternative to Remediation

■ Dana Duxbury, Dana Duxbury & Associates

Pollution prevention is clearly a captivating term in the "Decade of the Environment – The 1990's." Wherever we look, preventing a problem is more protective, less expensive and more attractive. What is pollution prevention? Pollution prevention is a means of preventing environmental degradation and preventing water pollution, air pollution, energy or resource usage, or generating hazardous waste. It is multi-media - air, water and land. Decisions that prevent pollution can be made in the office, in the factory or in the home. We can all be part of the problem or part of the solution. For example, once the decision to use a hazardous chemical is made a chain of events occurs. Workers and the environment are exposed to the chemical during either its extraction or during the manufacture of the product, users of the product may be exposed and other workers or the environment are exposed when it is discarded. This chain of exposure must surely be broken - especially for the more dangerous chemicals.

How is this happening? Individuals, companies and government all can and do play a significant role in preventing pollution in the first place. Individuals must become informed customers. They must read labels and attempt to choose products which do not carry the words "danger, caution or hazard." They must choose products that do not contain hazardous constituents. When there is no alternative, they must buy only what they need, they must seek to follow the directions for careful usage and see if there is any one who can use the remainder or ensure that when the product is disposed of, it is done so in an environmentally sound manner — maybe through a household hazardous waste program. Consumers must let manufacturers know that they want products to be made without toxic constituents. They must also seek to use energy efficient products, and ones that do not create excessive air or water pollution in their manufacturing process.

All sizes of companies can prevent pollution. This is usually accomplished by taking stock of what is happening today — an environmental audit, a multi-media audit. Raw materials are viewed with an eye to eliminating hazardous constituents or ones that create excessive water or air pollution or are large users of energy. The sources of releases are identified and then the production process is

studied in order to determine ways to eliminate these sources from the process. Pollution prevention experts attack the source of the problem as early in the production process as possible; not at the end of the pipe as happens with pollution control. Five basic approaches can be used:

- In-process recycling
- Changing technology or equipment
- Better in-plant housekeeping
- Change process inputs
- Change final end products

Once the audit is completed a plan is prepared — a pollution prevention plan. A plan that has corporate support, an evaluation mechanism, a reward system and a record-keeping function which measures progress towards goals is usually developed.

Many large industries have made significant progress in reducing pollution and many small and medium-sized industries often use the technical assistance provided by government to reach the same goals. Much remains to be done and much can be done which will ensure that a company is still economically competitive. Many firms have *saved* money implementing pollution prevention strategies.

Recycling is considered by many to be a lesser option since during the recycling process, pollution occurs. The materials have to be transported, energy must be used to process the waste and sometimes toxic components, if they are in the product itself, are released during recycling operation. The old adage "garbage in, garbage out" applies here.

Government also can not only preach pollution prevention but it can embody it as well. Whether government is the Defense Department or a local municipal office, ways to reduce the use of precious natural resources, energy and water saving devices or reducing the generation of hazardous waste through prevention rather than control measures are available to all.

How will pollution prevention affect the field of environmental protection in the 1990's? Throughout the next decade, the pollution prevention philosophy will manifest itself into all sectors involved with environmental issues. At the local, state and federal government levels pollution prevention programs will probably be set up either as sub-departments in already existing agencies or as their own independent multi-media agencies. State regulations (similar to those already in place in Massachusetts) will require industries to submit certified plans for pollution prevention programs. This will mean opportunities for those who are certified to work as part of the in-house staff or as consultants.

Mechanical and design engineers will play an important role in the evolution of pollution prevention programs. Current students should seek to take courses in waste reduction and pollution prevention. These courses are already offered by some of the leading

environmental programs. (If your program does not have these courses, push to get them included in the curriculum.) Another area that will see increased opportunities at the entry level will be in the management of household hazardous waste. As more and more state and regional governments set up programs, there will be a need for local coordinators to run the programs. This can be a good way to gain experience in the hazardous waste field.

Overall, the extent to which pollution prevention will prevail will be driven by the amendments to the Resources Conservation Recovery Act. Legal changes will dictate the way in which we solve our environmental problems. We need to prioritize the pollutants that affect health and environment most and pursue them vigorously while at the same time maintaining profits for industry. The best way to do this is through yield improvements, reduced waste and increased cost effectiveness i.e. pollution prevention.

Years of pollution control and our current environmental laws have not prevented resources from being consumed at a rapid rate, nor have they guaranteed that we have clean water or air, or that hazardous waste and energy are reduced, that wetlands are preserved and species diversity is maintained. There is much to accomplish. With a fresh outlook — a preventative outlook, we can ensure that our children look back on this decade and say that this country finally took stock and realized that we as a nation would have to make significant changes if we are going to leave a sustainable earth in our wake — and that we did it. ■

Dana Duxbury is an environmental consultant and founder of Dana Duxbury & Associates, which provides policy, educational, research and facilitation consulting services on solid and hazardous waste management issues to government, industry and public interest groups. Before establishing her own firm, she was Senior Environmental Research Analyst at the Center for Environmental Management, Tufts University. She managed the first three national Household Hazardous Waste Management conferences sponsored by the US EPA, started the Waste Watch Center and has fifteen years of volunteer service to the League of Women Voters of Massachusetts and the US League of Women Voters as a solid and hazardous waste specialist. She holds a BS in Biology from Cornell University.

Minorities & Environmental Career Opportunities

■ Gerry W. Stover, The Environmental Consortium for Minority Outreach

It is the general mission of organizations within the environmental community to actively promote or effect the protection, the preservation, and conservation of our planet's natural and environmental resources. To accomplish this goal, the environmental community needs a commitment from a very large and diverse spectrum of our society.

A major problem faced by all of the major environmental and conservation organizations in the United States today is the recruitment and retention of minorities for middle, senior, and executive level positions. In our country today, minorities make up a very large and growing segment of our society. Indeed, the Asian and Hispanic segments of our community are touted as the fastest growing segments of our populations. In some communities they will outnumber the white majority by the turn of the century. Our minority populations are fast becoming the predominant segments of our urban areas, and while minority communities are often the first to experience the physical and financial effects of environmental problems, their representation in the memberships, on the staffs, and on the boards of environmental organizations is woefully inadequate. The U. S. Labor Department's projected demographics of the American workforce indicate that in ten years, the workforce will be an older one with fewer young people entering the marketplace; women and minorities will make up almost seventy-five per cent of the entering workforce; there will be a shortage of qualified workers to fill the open positions that will exist, especially in scientific and other technical fields. The demographics also indicate that one of the other areas where there will be a great shortage is in the ranks of middle and executive management. By the year 2000, only one in four managers will be a white male.

No where is this crunch going to be felt more than within the environmental and conservation community. The presence of minorities (and to some extent, women) within the environmental community today is woefully inadequate. More than almost any other community or industry in America today, the staffs of environmental organizations, their management teams, their executive ranks, and their boards lack a vibrant minority presence.

Traditionally, environmental organization's staffs have been made up mostly of middle and upper-class white males. They have often been recruited through the "old boy networks" that are so very

prevalent in this country amongst the "liberal community." In the past, openings have often not even been advertised. They were filled by word-of-mouth, a quick phone call to an old friend, or by the sons or daughters of current staff. As a result, minorities have been automatically cut off from opportunities that they would be excellent fits for. In addition, these organizations have never done a good job of relating their work or their issues to the day-to-day existence of people of color. The result is that minorities have not felt welcome in this community and therefore have not sought out opportunities for careers with environmental organizations.

Through the years there have been repeated attempts to increase affirmative action efforts, yet, for the most part, the results have been dismal. In the past five years, less than 2% of all field staff and management hires within the environmental community have been minorities (based on an informal survey done last fall). The most commonly heard reasons for this situation are: 1) "The pool of qualified candidates is almost non-existent," or 2) "Recruiting takes time under normal circumstances — recruiting minorities can be an endless task with limited or no results," or 3) "Good minority candidates usually turn us down because of our salary levels or because of a lack of understanding of career potentials within our organization." These excuses can no longer be allowed to justify their lack of success in diversifying their staffs. In order to be assured the necessary leadership to continue their work they must begin developing the leaders of tomorrow today by broadening their outreach and enhancing their constituencies at all levels.

These organizations recognize the need to change their current situation if they are to survive into the twenty-first century. They want more minorities and women on their boards, in executive offices, and on the front lines. To do that, the progressive groups are implementing immediate efforts to increase minority representation at all levels of participation in their respective organizations through active and innovative recruitment programs. The creation of The Environmental Consortium for Minority Outreach, adopt-a-school programs, speakers bureaus, and internships are just some of the tools they are using. At the same time, active recruitment is not the complete answer to minority enfranchisement within the environmental movement. Retention has become an increasingly important aspect of this issue and one that is being addressed simultaneously with recruitment.

If recruitment and retention efforts are to be effective and more than just tokenism, the environmental community must recognize the need to address current *and future* environmental *and* social justice issues that disproportionately affect minority populations, particularly as they relate to communities in our nation's urban inner cities where there are high concentrations of minorities. To do so, minority perspectives must be brought to issue identification processes and to policy-making decisions. Minority leaders and commu-

nities must be included in all aspects of our work.

An educational process has begun, directed toward both the environmental community and minority communities about issues that are important to and affect each other. The environmental community must take the lead in explaining the importance of resource management, conservation, and environmental issues, particularly as they relate to the welfare of minority constituents. It must also promote these efforts in minority communities. Minority communities need to be included in all educational efforts about environmental issues and additional efforts must be made to promote partnerships that can work to effect real changes in the state of our natural environment. To be able to do this effectively, these organizations have begun to evaluate their organizational culture to determine areas of weakness in relation to minority involvement and participation in their work. They are educating their staff and management teams on the importance *and* the benefits of diversifying their workforce. They need minorities on board to help them do this.

The young person of color has a wealth of opportunities open today. The key is to understand the nature of those opportunities and to be prepared to take advantage of them. The environmental community has truly come of age. The larger organizations like the National Audubon Society, the Sierra Club, the Trust for Public Land, the Natural Resource Defense Council, and others need people with a wide variety of backgrounds and skills. They need scientists of all types, administrators with strong business skills, human resource specialists, financial experts, specialists in computer technology, etc. They are looking for individuals with solid writing, speaking, and analytical skills and the ability to learn *and* adapt quickly. The growing number of opportunities within the environmental field are not just limited to the not-for-profit sector. Governmental agencies and the corporate world are also beginning to get more involved in activities centered around cleaning and protecting the environment and preserving our planet's natural resources. Given the growing global approach to environmental issues, those individuals with interests and experience in languages and international policy will be in greater demand. Since two thirds of the world's population is Third World in nature, our environmental and conservation organization's credibility in dealing with global issues will become increasingly dependent on the involvement of our minority populations. More and more organizations and companies are looking to hire minority individuals with the potential to become their leaders of tomorrow. Many smaller grassroots organizations are also actively seeking minorities for community work, canvassing, lobbying efforts, and other work. As a result, there could be no better time than now to be a minority seeking a position within the environmental and conservation community.

What does all this mean to you specifically? How can you find

out about opportunities available now or in the future? How should you prepare yourself for a meaningful role in one of these organizations? What can you expect once you do find a position?

First of all, begin to learn about the organizations doing work in the environmental community. Call them, write them, or visit them with an eye to learning about the issues that they work on. Ask to be put on their mailing lists for job announcements and/or for annual reports. Join those organizations that are membership oriented. Many of them have student memberships available at discounted prices. If you can, find the time to volunteer your services to small grassroots groups. Don't hesitate to let personnel staff know that you are a minority. Learn about material resources available. Books like the National Wildlife Federation's *Conservation Directory* give information about hundreds of environmental and conservation organizations and it can be found in your local library. Check your career guidance offices for flyers and pamphlets listing openings within the community. Publications like the Student Conservation Association's *Job-Scan* are published and updated regularly. Finally read newspapers, magazines, and periodicals. Familiarize yourself with the issues of the day. Learn which organization is doing what on which issue. Add books like Aldo Leopold's ***Sand County Almanac***, the Natural resources Council of America's ***National Leaders of American Conservation***, and Raymond Dasmann's ***Environmental Conservation***, the Report of the President's Commission ***Americans Outdoors: The Legacy, The Challenge*** and others to your reading list. Obviously, course work in Environmental Science and/or Resource Management won't hurt either.

Many employees in environmental organizations got their career starts by being interns. These opportunities, which in the past have often not been viable ones for minorities, are suddenly opening up. Traditionally, internships in the environmental community have been either unpaid or low-paid. This is rapidly changing. More and more organizations realize that minority students have to work for pay during their summer vacations in order to continue their educations. As a result, there are more and more internships that pay very viable stipends. Investigate these opportunities. Ask career guidance staff and faculty members to assist you in this search or in making introductions to the community. If you get an internship, take full advantage of the opportunity afforded. Get to know the workings of your organization. Cultivate a mentor for yourself from within the ranks of the organization and when you go back to school, maintain the connection and build on the relationship.

When you apply for a position with an environmental or conservation organization make sure your resume includes all of the extracurricular activities you have participated in regardless of their connection to environmental issues. In your cover letter, make certain to mention that you are a minority. This will almost assuredly get you an interview. As with any job interview, be prepared

and don't be afraid to ask questions about the organization, the job, and the work environment. Ask about career paths and opportunities and don't forget to learn about benefits. Ask your interviewer about their path to their current position and why they work there. Even if you don't get that position, you'll make an impression that can help with the next one.

Once hired be prepared for some cultural shocks. In many cases you will be the only minority in your department in a non-clerical support position. Often you may find that you are one of very few other minorities. Because the work of environmental organizations often becomes a passion for employees there is often a closeness that develops among the staff. It can sometimes take a good deal of time before anyone is accepted into this "family". Don't be discouraged. You are being judged on your dedication to the "cause" and on your ability to perform. You may even find that you come under closer scrutiny than other new staff members. Until their are more minorities within the ranks of these organizations this situation is likely to continue. You will also find that you are often expected to speak for all Hispanics or African Americans or other minorities. Don't hesitate to make it clear that your opinions don't necessarily reflect those of other minorities. I guess what I am saying is that it is important for your own success and more so for the benefit of your brothers and sisters that you be yourself. Don't feel forced to change to meet others' expectations. In order for the environmental community to appreciate a truly diversified staff, they must learn who we are and what we are really like; both the differences *and* the similarities.

The staffs of environmental and conservation organizations tend to be a very well educated group. Outside of my academic experiences, I have found no greater stimulation or challenge to my intellect and my capabilities. I have also found a community that was eager to break down the walls of isolation once there was a mutual understanding of my personal dedication to our mission. There is no greater joy in one's professional life than to have the opportunity to work with people dedicated to a common goal. Even though overall this is a very educated community, their experience with people of color and with cultures other than the white male dominated one is limited. Insensitive actions and remarks are not uncommon. They are generally the result of ignorance. Don't be overly sensitive, but don't hesitate to correct or point out intolerable behavior. You do both sides a favor when you are open and direct in these instances.

Once on board don't stop learning. Find out what others do and how it relates to your work. Again, **Get a Mentor!** Become close with someone who is a seasoned professional; someone who can show you the potential pitfalls to your rise through the ranks. Learn where the power base in your organization stems from and make certain

that you and your work are visible to the powers that be.

Finally always be alert to new opportunities within your organization and the community at large. Get to know who your counterparts at other organizations are and be sure that they know you. There is a tendency for people to move around amongst the organizations. By developing these contacts and becoming a part of the network, you will find a growing wealth of opportunity open to you.

This is an historic time with regards to the environment and conservation. As I said earlier, we are in the midst of major changes occurring within the environmental community. The traditional methods of addressing issues concerning our planet's and our communities' health is rapidly changing and for the better. The involvement and participation of minorities will increase drastically and very quickly over the next decade. The focus of many issues will be adjusted to address concerns of minority peoples and the constituencies of organizations working in this field will broaden to include many currently disenfranchised groups. The opportunity "to be in on the ground floor", so to speak, has never been more available in any profession. Use who you are to take advantage of this opportunity. ■

Gerry Stover became the first Executive Director of The Environmental Consortium for Minority Outreach (TEC) in May of 1989. Before joining TEC he was Director of Personnel Administration at the Trust For Public Land (TPL) in San Francisco. Prior to TPL, Mr. Stover spent four years as Regional Manager for a San Francisco based human resource consulting firm. Mr. Stover is a member of several organizations' boards of directors including Earth Day 1990, the Human Environment Center, and the National Celebration of the Outdoors. He is a member of Concerned Black Men of Washington, DC and is on the Mayor's Summer Jobs for Youth Taskforce. He holds a bachelor's degree in psychology from Amherst College and a masters degree in industrial relations from Stanford University.

The Liberal Arts Major as Environmental Professional

■ **Dr. Alan M. Schwartz**, Professor of Environmental Studies, St. Lawrence University

Environmental problem resolution by its very nature demands interdisciplinary skills and holistic thinking; it requires people who can synthesize information and use that information to formulate new questions. A liberal education is concerned with specific knowledge, but more than that it is concerned with the means by which knowledge and judgment can be acquired. It is the goal of a *liberal* arts education to develop within students the ability to ask sophisticated questions and logically utilize and synthesize information. Thus by definition a liberally educated person is an ideal candidate to contribute to environmental problem-solving.

The earliest writings in environmental management discussed the myth that environmental problem solving was the domain of the technocrat or narrowly trained specialist. In 1975, A. B. Garlauskas' article, " A Conceptual Framework of Environmental Management", *Journal of Environmental Management*, discussed the necessity of bringing many skills and areas of expertise to environmental problem-solving. Garlauskas believed that environmental problems needed people who understood the physical environment: the geologist, the biologist, the chemist. But these specialists were not sufficient to resolve most problems. While engineers and scientists contributed valuable information, final problem resolution and the implementation of solutions, often required utilized political scientists, sociologists, economists, and others.

Liberal arts colleges today, may be the best place to acquire a science education. Many young graduates are combining a broad liberal education (which may include courses dealing with social, economic, or legal dimensions of environmental problems) and a basic in-depth knowledge of a "hard science". In some institutions, the natural science curriculums are so confining, that little time is left for environmental courses outside the sciences. However, many enlightened programs are letting students combine majors in science and environmental studies with the environmental studies portion being a diverse array of courses that include environmental politics, environmental economics, and other areas that complement the science. Other science programs have not only provided the foundation of high quality science education but have enriched that foundation with courses that address environmental concern, e.g. environmental geology, conservation biology, environmental chemistry. The people who graduate from these programs will be well equipped to

contribute to environmental problem-solving. Indeed, these students may be better equipped than many of their peers who have a good science background but little beyond that.

In addition to understanding the natural environment, the next generation of environmental problem solvers will clearly have to know how to motivate a diverse number of publics to solve problems. Solving problems of waste disposal, air quality, and even endangered species will increasingly rely on people with political and economic skills as well as scientific knowledge. Problems of great complexity will demand environmentalists who can interpret data, use it to formulate new questions, and bring together the necessary specific expertise to resolve uncertainty. Broadly trained liberal arts graduates who include environmental courses in their education will be well poised to fill these needs.

Make no mistake, technicians will be needed. Technical experts, engineers, and lawyers will certainly continue to play key roles in the resolution of many environmental problems. But training in these professions is only one path toward involvement in environmental careers. Garlauskas goes on to say that information on the natural world provided by scientists will not suffice. Increasingly there will be a demand for generalists; people with strong communication skills, both written and oral, and people with political skills. These environmentalists will be critical as problems previously addressed on a federal or state level are increasingly confronted on a local level. His words written more than fifteen years ago could not be more true today. How many well laid engineering plans costing millions of dollars have merely collected dust because public opinion was not built into the process? Sociologists or political scientists may not be able to design a recycling center, but their involvement may be an essential ingredient for its success.

I believe solid waste reduction and disposal is an interesting case study that can be used to illustrate my thesis. In ***Becoming an Environmental Professional, 1989***, the proceedings of the CEIP Funds Fifth Annual Careers Conference, a panel was held to discuss solid waste reduction and disposal. The three participants, all young professionals involved in solid waste matters, had varied undergraduate majors. It is unlikely that any of the three had much experience in dealing with solid waste issues during their undergraduate training. Instead, their expertise in land resources, economics, and environmental studies included skills that were adaptable to many problems and which they could readily focus on the solid waste problem. It is clear that while engineers can design incinerators and secure landfills, source reduction and recycling programs are going to depend upon environmental policy makers who can analyze public opinion and motivate public behavior. These are people who have strong communication skills, people who can write a clear concise informative report, people who can conduct and analyze surveys, people who possess analytical skills to interpret

data, and people who can motivate people. Ten years from now there will not be a single municipality that will not be involved in developing recycling plans, analyzing recycling markets, and refining waste reduction strategies. People with liberal arts backgrounds will be in the forefront of this movement. Solid waste is only one example of the movement of environmental problem solving to the grass roots level which will aid in creating more employment opportunities especially for broadly educated liberal arts graduates.

The requirement for both breadth and depth in liberal arts programs will place the liberal arts graduate in the best position to combine knowledge in traditional majors such as biology, economics, or sociology, with skills such as writing, rhetoric, and analytical thinking. Today, there is not a high quality liberal arts college in the country that is not stressing better writing skills and better communication skills for its students. Individuals possessing these skills will be in high demand in many professions including environmental careers.

Liberal arts graduates often have an additional advantage to the narrowly trained specialist; they learned how to gather new information and analyze it. Most undergraduates in todays small liberal arts colleges have been given the opportunity to conduct research. This may take the form of a large scale endeavor such as a senior thesis or a much simpler project associated with a specific class. The skills for conducting research be they investigative skills in the library, skills in quantitative data analysis, or skills in public opinion surveys, once learned through "hands on" experience become a permanent acquisition. They not only provide answers to the question at hand, they provide the means to ask and answer new questions.

It is obvious that anyone planning to spend a substantial part of their life's work involved in an environmental profession will require a graduate degree. A liberal arts education provides a great deal of flexibility for students, allowing entrance to a diverse array of post graduate opportunities that may not be available to those who choose to specialize during their undergraduate education. From a relatively small undergraduate program at St. Lawrence we have seen students pursue degrees in law, environmental health, business, planning, and policy and management, as well as in traditional disciplines. Indeed specialization after the acquisition of a broad liberal arts undergraduate degree makes a good deal of sense.

Will every liberal arts graduate be in a position to enter the environmental field? Although the skills of liberal arts graduates will become even more highly valued in the future, liberal arts graduates who combine depth as well as breadth, will be best poised to meet the challenge. Increasingly I see the environmental studies generalists who choose one or two courses from many areas at a disadvantage to those who combine firm grounding in a traditional discipline and a thematic environmental education. Students with combined

majors, or interdisciplinary majors that offer some depth, will be able to move quickly to a wide array of occupations.

One could argue that my thesis represents the wishful thinking of someone who teaches in a liberal arts institution and does not reflect reality. On what do I base my optimism? In 1993 the environmental studies program at St. Lawrence University will celebrate its twentieth anniversary. I have now been teaching long enough to see our graduates enter environmental professions and provide internship and job opportunities for the next generation of graduates. The diversity of responsibilities now shouldered by environmental majors who combined traditional disciplines (e.g. economics, political science, sociology, biology, and geology) with environmental studies is truly staggering. Not only is the array of jobs impressive but so is the variety of sectors represented. Examples include professionals in national or regional non-profits (National Audubon, Great Lakes United), local non-profits (the Adirondack Land Trust), public planning agencies on local and state levels, the federal government (EPA, Bureau of Land Reclamation), and private consultants. We even have a few graduates using their expertise on what some may consider "the wrong side", including researchers, lobbyists, and attorneys for developers. While our program is long standing and we are justly proud of the accomplishments of our graduates, we are by no means unique. Although the pathways to their chosen environmental fields vary, common threads bind the experiences of our graduates. Each of these successful environmental professionals combined training in a traditional discipline with a thematic environmental education; each understood a wide variety of environmental issues; and each had the opportunity to do meaningful research and/or internships during their undergraduate years. Some of these graduates began their careers in jobs which complemented the work of more technically trained individuals and later were promoted to positions overseeing staffs of technical professionals.

The fear of not having a well developed area of expertise for that first job is sometimes terrifying to liberal arts graduates. But indeed, as the biologist well knows, in times of rapid change, a generalist does exceedingly well. In the next decade, as environmental problems change radically the solutions to them will demand some of the same basic skills as todays problems require: clear thinking, clear writing, clear communication. Here the liberal arts graduate will continue to make substantial contributions. The first job will certainly be the most difficult to acquire, but for people interested in careers not merely jobs, a liberal arts education will still hold a great deal of promise. ■

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primary research involves the study of U.S./Canada environmental relations. He has published several articles on the role of the International Joint Commission in environmental dispute resolution and next year his sabbatical leave will be spent studying the U.S./Canadian environmental relationship in the Reagan years.

Changing Careers

■ Barbara Gilvar, Principal, *Isaacson, Miller, Gilvar & Boulware, Inc.*

Why Change?

Articulating what is not satisfying

Many of us change careers for many reasons. We may learn that we do not like elements of the work we have prepared for but never fully understood. We may learn about a new field, as I did. We may have spent many fruitful years at a particular occupation and then looked at the years ahead and decided a change would be refreshing.

The unsatisfactory feeling is very real, but the prospects of inventing or creating a new career path can appear overwhelming. Like most other things, many people have spent time thinking about it, writing about it, and setting up businesses to help. It is important to understand the differences which books and accounting firms may represent. Books like ***What Color is Your Parachute?*** are designed to help an individual asses their preferences and capabilities in order to strike out in a whole new direction. At the opposite extreme, out placement firms most often guide job seekers to new jobs, perhaps in new industries, but within the same functional area.

I am assuming here that a more drastic career change is the desirable path. It may be for many reasons. The content of the work may not be satisfying. Your realm of responsibilities may no longer feel appropriate. The relevance of your work or that of the organization may not meet your needs. Perhaps the size of the organization feels wrong, or you want to move from a non-profit to a government agency or to a corporation, or in the reverse direction. The dilemma seems to be about how to make a dramatic transition. The first step is to be very clear about the elements that make your present job or career unsatisfying and then to understand what the elements you need in the next job are.

Imagining the elements of a perfect job

Imagining the perfect job can be accomplished through comparing yours with that of someone you know, or, elements of what you are looking for can be discovered in a job you will never have but wish you could. If being the head of the US EPA is your ideal, identify the elements of the job which you desire. Are they:

— a feeling of making a difference?
— having people listen?
— limiting environmental abuse?
— an array of problems to solve?

Those satisfactions can be found in many other settings.

If you imagine the perfect job as heading Greenpeace, what does that mean?

- mobilizing public attention to important issues?
- mobilizing citizen support?
- the feeling that you have joined the activist cause?
- figuring out which of the many environmental problems can be most successfully addressed with available resources?

The elements that make the role satisfying are possible in many other settings. You need to think through your own needs, be able to articulate them clearly, and then move toward finding the organizations where you can make a contribution and have a more satisfying role.

Discovering the Kinds of Organizations Which May Meet Your Needs

How and where to conduct the search

Library research is a good starting place. If an issue such as global warming is one you want to work one, surely the first step is to understand the state-of-the-art research on the subject. Technical journals can add to your information base and give you ideas of which organizations are addressing the issue and which may be adding new programs and new staff. Public and university libraries have computerized databases which will help you research topics and organizations which interest you. Specialized libraries like the one at CEIP will offer clues on the gamut of environmental organizations, both regionally and nationally.

When you have discovered organizations you wish to learn more about, call and ask for any public information they might offer. Next think of friends, neighbors, professional colleagues who may know the organizations or someone in them and engage those people in your research. Figure out which associations might be useful, get samples of their newsletters which may also post job openings, attend meetings where possible, to learn more about the issues and to meet people who may be helpful in your search.

The meaning and use of informational interviews

The objective of the informational interview is to further your research through people. The protocol is that you are seeking information, not a job, so you do not put people on the spot thinking that you will be unsatisfied if they can not hire you.

The nature of your request should be to learn more about their field, a particular organization, or the requirements of a specific role. People respond for multiple reasons. First, if they like what they are doing, they will be happy to talk about it. It also is simply professional courtesy to offer information, to assist someone genuinely

interested in the field.

It is best to be very specific with an individual during an informational interview. If you have several directions that you are exploring, that is not the domain of the informational interview. Use this opportunity to learn more about the area this person knows best. They are not your career counsellor.

During an informational interview, you should be clear about the information which would be useful to you. This might be the kind of skills required to do the job this person holds, or it might be to understand which corporations are most receptive to environmental considerations, or which government agencies have an activist bent, or which non-profits may be adding new programs. Obviously you never know an individual's full network, and a conversation that begins on one topic may lead to others. An additional objective is to learn of other individuals who could provide you with more information.

Informational interviews may turn into job interviews. Or they may lead you directly to a job opening. Keeping information as the primary goal never intimidates the information provider while leaving room for other benefits.

A simple thank-you note is required. Make it specific, acknowledging what you learned that was helpful. A subsequent note to those who have helped you in your endeavor is an appropriate response to the assistance they provided.

Writing a resume

Resumes are an introduction. When you start this campaign, you probably already have one. Chances are it is not right for your new direction. It should change as you learn more about a new field. It should incorporate what you learn from research and from informational interviews about the talents and skills needed in your new chosen career path which match those you have already tested.

Writing a resume should flow from what you have learned about your skills and preferences. You may have a set of skills that you have used consistently which no longer are satisfying. It may be that you have been a successful facilitator of the work of others, but you now need to find a role which requires more creativity and your ownership of a project. This needs to be clear to you because it guides your search. What you want to do, and examples of your ability to succeed at it, should be clear in your discussions with people and clear on your resume. Your resume should not highlight things you never want to do again.

Write a new resume when you understand what skills your chosen path requires. Your reading, research, and informational interviews will have taught you how to translate what you have done to a new audience. Be prepared to amend the resume as you learn more.

The key elements of the resume should be accomplishments, citing difficulties, the size of the problem, obstacles and results. An

example might be organizing a media campaign around manufacturing discharges. Newspaper and TV coverage enabled a regulatory agency to enforce limitations. Or, you proposed an alternative HVAC system with higher initial costs but with significant long term savings and it was adopted by the organization. Wherever possible, include numbers which quantify the achievements.

Resumes which list "responsible for" and "assisted in" simply give no indication of what you did or did not do. ***What Color is your Parachute?*** has an inventory which is useful for emphasizing skills and suggesting the action words to describe achievement.

Defining Your Own Skills in Marketable Terms

Understanding where skills and preferences overlap

The first requirement is for you to be able to articulate clearly what your experience has been and what you can contribute to a new organization. You need to be concise, memorable and assured. Thinking through your strong points and your accomplishments will help you to be concise. Linking your successes in terms of key skills which you poses and consistently use provides a theme which people remember you by. Because informational or job interviews are key, brief opportunities, you need to have a confident to worry with — which gives you the freedom to express concerns there and still be prepared for interviews.

Translating those skills and abilities to a new audience

Prospective employers will present an opportunity in its best light. Present your strong points with the right blend of modesty and acknowledgment. Remembering compliments you have received is helpful here. Think through your toughest assignments and what enabled you to succeed. Be prepared to say what did not work well, what you learned, and how you applied that learning the next time. When asked your weakness (interviewers are not always subject to the rules of courtesy), your response can be in terms of what you have learned (examples might be delegation, consensus building, attention to detail) or in terms of how you compensated (hiring a detail-oriented assistant, doing the tedious things first).

Structuring the campaign

There are many books on the subject of career change and all the elements such as informational interviews and writing a resume. Find one that fits your style, understanding that this endeavor stretches everyone to go beyond their former level of comfort.

A campaign for a new career direction requires a timetable. You need to think through the amount of time you have, either while continuing your present job or while looking for a new one full time. Keeping in mind that this is a search for a career path and not a job will enable you to explain your process better to those giving you advice or are wondering why you want to take so long at it.

Whether you are looking full time or working full time, you need a schedule and goals for getting research done, for the number of informational interviews you will schedule and carry out. Your campaign will be a mix of informational interviews, following up on those leads, job interviews, responding to ads in city newspapers and specialized journals, and acknowledging your meetings with appropriate notes.

Interviewing

Some of the same guidelines apply which were true for informational interviewing. Having spent time thinking and writing about your achievements on your resume should allow you to be articulate, concise and consistent. Doing research through annual reports and through people before an interview gives you more information on what aspects of your experience are relevant, and it gives you the ability to ask significant questions. If an interviewer asks you to describe what you would do if you came to a company and were presented with a particular problem, move gracefully to a similarly complex situation which you dealt with successfully

Understand that an employer never hires you because you want a career change and more interesting work. An employer hires you because you can solve problems which the organization faces. Always state your objectives in terms of the contributions you can make.

Following up an interview with a brief letter is always appropriate. It can be as simple as restating your interest. If you want to reemphasize something this is the opportunity. If you wished you had included something, or stated it more strongly, this is also an opportunity to do that.

As you proceed through your job campaign, the steps overlap. You plan a series of meetings while you are still engaged in research. You conduct informational interviews while you are also having real job interviews. You may be responding to ads but you should also be actively seeking opportunities through people. Always pursuing a number of avenues provides a better guarantee of success. It also puts you in the position of always having next step plans and hopefully of having several opportunities to choose from. ■

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Volunteering: Unpaid Avenue To Paid Professions

■ Kay Drake, Volunteer — The National Center

Volunteer, The National Center

National Service, community service, service learning — whatever you choose to call it, volunteering is what is involved. There are over eighty million people who volunteer, nearly one half of the adult population in the United States, according to *Giving and Volunteering in the United States*, a 1988 Independent Sector study.

Volunteerism is generally thought to be motivated by altruism. Studies have shown that most people volunteer because they want to help. However, it is recognized that volunteers often have multiple motives for providing service. Retired persons may volunteer to remain active and exercise skills and talents that they have. College students may become involved with volunteering to advance a cause. High school students may volunteer in order to gain academic credit. Professionals who relocate to a new city may volunteer to develop new friendships. Religious persons may volunteer because of personal convictions.

Nonprofit organizations and government agencies "in the know" acknowledge that there are different motivating factors for volunteering. A contributing factor to a volunteer program's success is seeking too meet the needs and expectations of the volunteer while conjunctively meeting the needs of the organization. Potential volunteers will want to know how they can serve and where they can serve. They will want to know how much time is required, whether special training will be offered, and for whom they will be working.

Volunteer-involving organizations have come to realize that it is not enough to send out a message saying, "Help Wanted: Volunteers!" With more and more volunteer options becoming available, a competitiveness has arisen between organizations for volunteers. In seeking to attract volunteers, it is to the recruiting organization's advantage to communicate that benefits can be derived from volunteering with their agency.

Some think that beneficiaries of volunteerism are the recipients of the service alone — the community or the individual for which the program is planned to assist. However, there are many benefits to be derived by the volunteer, as well as by the agency providing the service. An agency can benefit in the form of public recognition for the provision of volunteer services. The use of volunteers can increase the organization's capacity to serve, and also documented evidence of successful volunteer initiatives can enhance an organiza-

tions ability to gain funding. As a volunteer you can benefit by becoming more sensitive to the conditions and/or needs of the community being served. Volunteering also allows for exploration of job options, it allows you to develop work experience, and to establish contacts and/or references with persons working in a particular field of interest.

Contrary to what some people think, it is perfectly acceptable to pursue volunteer opportunities for non-altruistic reasons. If what you need is job experience, volunteering is an option for obtaining "hands on" experience. If what you need is to explore career options, don't overlook volunteering as an vehicle for learning about the kind of work different professions entail. Volunteering can also provide you with the opportunity to work with professionals in your field of interest.

Yes, volunteering can be the avenue to paid employment in the field of your choice, though it is not yet a frequently traveled path to careers. When you volunteer, just as when you take on paid positions, you should keep a portfolio of your interests. Document information about the work you perform, any recognition that you may receive, number of hours spent volunteering and names and titles of persons that you work with. Keep certificates of appreciation, newsletter articles or other forms of recognition. If they don't provide it automatically, ask the volunteer program director to provide letters of recommendation and/or reference.

Increasingly, employers are becoming aware that valuable experience can be gained through volunteering. In the instance of recent college graduates, potential employers do not expect an interviewee to have a lot of paid job experience. Yes, many students do work to help pay for college costs, but its not usually the case that they have an opportunity to work in companies or organizations where they get experience in their field of study. However, in interviewing recent graduates, employers will look for evidence that the expressed interest in a particular career direction is not just one tailored to meet an employer's expectations. A potential employer will be more convinced of an applicants interest in a particular job by looking at his choice of internships, extracurricular activities, organizational memberships and volunteer activities. All of these experiences can help fortify your efforts to convince a potential employer of your capabilities.

President Bush, a key promoter of volunteerism, issued a call for companies to recognize volunteer job experience. In a speech announcing the formation of the "Points of Light Initiative", the President urged all heads of business and professional firms to include community service among the factors considered in making hiring, compensation and promotion decisions.

In 1988, the congress adopted a concurrent resolution that encourages employers to consider volunteer job experience when making hiring decisions. Called "Volunteers and the Importance of Volun-

teerism", the resolution authored by Congressman Augustus Hawkins (D-CA), states that:

Volunteer work should be taken into account by the Federal Government, state and local governments, charitable and service organizations and private employers in consideration of applicants for employment.

The resolution also specifies that space be included on employment application forms for volunteer job experience. The SF 171 form used by the Federal Government includes this space as does the employment application forms of many state and local governments and corporations.

Your experience may be gained over summer breaks through volunteer vacations or by volunteering several hours a month for an organization of your choice. People unfamiliar with the world of volunteering often do not realize the myriad of volunteer possibilities available.

Don't think that all environmental volunteers do are plant trees or clean up parks. Volunteer opportunities in environmental areas are countless. Whether your interest is in managing natural resources, soil conservation, solid waste reduction and disposal, water quality control, air quality control, toxic chemical management, urban land use, or any other environmental area, there is a volunteer position somewhere that will enhance your career growth. Take soil conservation for instance. Listed below are examples of the type of volunteer positions that might be considered.

Civil Engineering Draftsman – Assists design engineers and geologists. Plots cross sections from topo maps and field survey notes. Operates print machines to reproduce drawings and design sheets. Prepares and check geological drawings.

Conservation Aide – Assists staff with conservation education by scheduling and giving conservation programs to schools, clubs and organizations. Assists with the layout and survey of soil conservation practices.

Field Assistant – Check conservation practices such as terraces, waterways, and seedings to determine condition of practice and maintenance needed.

Soil Scientist – Assist Field Office staff with soil investigations for conservation practices as well as for land use.

Watershed Land Treatment Coordinator – Collect and assemble information from land owners in a watershed region that identifies a need for and an interest in conservation practices.

These examples of volunteer jobs are provided to give you an idea of the breadth of experience to be gained through volunteering. There are opportunities for on-the-job training, advocacy, scientific research, hiking and ski trail construction, erosion control, historic

preservation, creating wildlife habitats, lobbying for environmental protection groups, writing for an environmental publication — the list goes on and on.

How do you go about getting this volunteer experience? The first step would be to contact your local volunteer center. Volunteer centers exist in 325 communities throughout the United States. Sometimes called Volunteer Bureaus, Voluntary Action Centers or similar titles, Volunteer Centers serve as clearinghouses for volunteer opportunities. Another way to get involved is to contact your state environment and/or natural resource departments. Also national environmental organizations such as Greenpeace, The Nature Conservancy, Student Conservation Association or the Izaak Walton League of America can direct you to local activities where you may be able to supply your talents and energies. ■

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Observations on the Environmental Field.

Human Resources: The Key to Environmental Solutions in the 1990's.

■ John R. Cook. Jr., President, The CEIP Fund, Inc.

In discussions on the protection of the environment, a lot of time is spent talking about the natural resource base while forgetting the most important resource of them all: people — staff, volunteers, citizens and leaders. The primary focus of my observations is people as they are the key to problems and solutions. They are the target in the social action strategy to solving environmental problems.

As a forward to my observations, I view environmental affairs from a different perspective. This is from process rather than an issue point of view as that is how we operate as our environmental career organization. Our approach is a different, nonadvocacy one which seeks to place responsible managers throughout the community who are committed to protecting the environment and the natural resource base.

This is done through 'state of the art' human resource management techniques with the philosophy that people are the greatest resource of any organization. They need to be instilled with a strong environmental ethic that will be incorporated into the existing ones of their organizations. The net result of this is environmental professionals and managers working throughout the community with a common bond and commitment to protect the environment.

In your reading, it is important to keep this bias in mind. While I address problems in the environmental field in this article, I did so within the context of opportunities as that is where the career possibilities are. The limit to finding and exploiting these potential careers is your own imagination.

1. Resource Integration & Environmental Impact. In the short run (10-15 years), there are enough resources (people, funds, equipment, structures, etc.) to solve particular problems. The protection of the environment is a multi-billion dollar industry with government, industry, consulting firms, academic institutions and non profit organizations all responding to the environmental crisis. The problem is that they are poorly planned, managed and integrated as the

organizations with the resources are more concerned with bureaucratic/institutional needs rather than positive environmental impact. This does not solve problems if anything, it adds to their complexity and obscures the ultimate solution.

This is illustrated by: The numerous laws and regulations at all levels of government with little or no communication, collaboration or cooperation in their development and implementation. It is almost as if the legislative bodies are competing to pass the perfect law without being concerned about how it relates to existing ones or its overall environmental impact.

There are over 30 marine research labs on the West Coast with overlap of research, education and training and minimal coordination. At one major university center, the facility can accommodate over 200 people and the largest number of people using it is 20. There are 4 major facilities within a 50 mile radius, also under utilized.

Non profit organizations and governmental agencies are often competitive, over lapping, inward looking and not understanding that the needed goal is building a conservation ethic within the general public and not fighting each other. It is similar to feudal states warring with each other while the Visigoths pillage the countryside.

The environmental field needs to set its goal of maximum positive environmental impact and then plan and manage its resources and actions with that single goal in mind. The health care field does this with medical planning councils, preventing every local hospital from having a $2,000,000 high tech machine when only one machine is needed. The mental health field is a very powerful political force because it speaks as one, having worked out its differences and territory before going public.

Opportunity is in the mobilization, coordination, stimulation and inspiration of these people and extensive resources to focus on the goal: the environment, its protection and our preservation.

2. Regulations & Advocacy. Assessing blame is time consuming, expensive and does not ultimately solve the problem. In the early stages of the modern environmental movement, it was needed to increase public awareness. Now, this approach works to the detriment of the community and the environment.

The players in the legal/regulatory system (governmental regulators, environmental organizations, corporate staffs and individual lawyers) have major investments in the current system so change and evolution is extremely difficult.

In the broad sense, all of us are to blame for the problems. For as Pogo says, "We have found the enemy and he is us!" If we as a community want a cleaner environment, then we will have to make changes in our current way of living. It is another version of NIMBY: 'Not in my back yard.' As Wendell Berry states, "it is difficult to have a guilty producer and an innocent consumer."

Opportunity is to re-invent the system or stimulate its evolution to more practical, direct methods of solving problems. This starts with the individual and grows outwards to include organizations, etc. How do we protect and clean up the environment through better, more direct and constructive methods? How do we challenge the individual to take responsibility for their own environment rather than delegate it to large institutions or 'experts'? The process is from the bottom up and the inside out as the action needs a broad base and a central core.

The Montreal Protocol addressing the CFC/ Global Warming issue is an emerging example where agencies, corporations, organizations and scientists from all over the world hammered out beginning solutions to these complex problems.

3. **People, Skills & Talent.** Key Trends:

A. *Demographics*. There are 500,000 to 1,000,000 fewer people coming into the work force on an annual basis from now through the year 2010. The baby boom is now the baby bust.

B. *Increasing Sophistication & Complexity*. The environmental field has strong science & technology needs with a growing demand for people with liberal arts backgrounds to serve as translators.

The environmental field cannot compete in the open market place. In the past, there was an over supply of talent and consequently, a buyers' market. That has all changed with the growing scarcity of talent and the tightening labor market. For example, the Office of Technology Assessment predicted a shortfall of 30,000 engineers to implement the Superfund Reauthorization Act. This has happened with projects behind schedule due to a lack of talent, among other problems. Graduates right out of college are making $50,000/year if they have the right degree.

On top of this, the environmental field does not have the general personnel management systems to attract, train and absorb large numbers of people like other professions do. This is compounded by increasing competition for talent due to the demands of America trying to compete in the world economy. All of this illustrates a talent bottleneck at the point when the needs are growing significantly.

Opportunity is to stimulate the suppliers of the work force to respond creatively to the challenges of the environment.

C. *Minorities & Socioeconomics*. The base of the environmental field is very narrow. To establish an environmental, conservation ethic to save the earth, the base has to be broadened. This will be very difficult because the field is resistant to changes and advances.

For example, in the past eight years, the budgets of most environmental organizations have expanded considerably with increased contributions. There has been little or no progress in the hiring of minorities or out reach into minority communities. In some cases, there have been declines. There are many participants in this reality.

Opportunity is to broaden the base of the environmental move-

ment adding important political support; to establish new supply lines of talent and to develop an agenda to support the diversity in our local communities as well as the natural world.

D. Corporate Environmental Managers. There is a major resource of people who are actually solving the problems on a daily basis and who are virtually ignored by the the environmental field. This is because they work for the bad guys: the corporations. And yet, they often have a deep seated concern for the environment which is often the minority viewpoint within their own bureaucracy.

Opportunity is to build a common bond among environmentalists and to arm these individuals to instill the environmental ethic and conservation values wherever they work and live.

There is a vast gap between those who make the policy, regulations and laws and those who actually solve the problems at the local level on a daily basis. The narrowing of this gap is an opportunity for greater positive environmental impact.

4. Environmental Journalism (Electronic & Print). Many do it, but few (very few) do it well. There are two factors among many that contribute to weak environmental reporting. First is the way the business operates: beat reporters who are shifted around from issue to issue and geography to geography leaving little time to develop a broader than superficial knowledge of the issues. The environmental beat is very, very complex as it cuts across the entire community, economy and world. It has to be one of the most difficult stories to cover and yet, it gets limited attention.

Second is the focus on the symptoms, the disasters, the negative (vs. the positive) and not on the underlying problems and their solutions. This superficial coverage sensationalizes the issues, over simplifies the picture and polarizes the players into good guys and bad guys — all fighting for the limelight.

Opportunity is to help the media to tell the environmental story in such a way as to aid the process and solutions with the goal of greater positive environmental impact.

5. Youth. The environment will continue to decline unless we work with the present problems and develop future opportunities with young people. As in the past, they are the hope as it is their world that will feel the impact of our actions. Environmental education is the answer and it is not the answer. Past efforts on the whole have not worked because environmental educators have tried to set themselves up as a basic subject like math, science and English when integration with the key subjects was the need. They tried to out academic the academics and got destroyed because of poor strategy, plans and lack of resources.

And yet, there are some street fighters, individuals versed in community and educational guerilla warfare. These are environmental cockroaches who have survived to stimulate, promote, encourage and inspire environmental values in spite of a fog of

bureaucratic pesticides. Their influence and impact is small, strategic and very powerful for it is they who have inspired the current environmental professional. Collectively, these are individuals who have swum upstream, gone where others won't go and persisted for the environment.

Opportunity is find, recognize and reward these special environmental educators and develop new methods and models to broaden and expand these select few both inside and outside the educational system.

6. Individual Responsibility. Many people delegate their environmental responsibility and blame to agencies, organizations and corporations when they have a major stake in the positive and negative impacts. In terms of environmental clean up, major strides have been made over the last fifteen years in all areas except with individuals where, if anything, there has been a regression.

This is illustrated in such areas as the dumping of household hazardous wastes like cleansers, paint and strippers; the lack of demand for consumer products with minimal environmental impact, the rise of convenience packaging or the lack of even basic recycling.

In many cases, individuals delegate this responsibility, this blame to other institutions with a vote, a contribution and/or a statement when their individual action is what is really needed. This is true directly with their participation and indirectly as an example for others to follow and be inspired into action.

Opportunity is to stimulate, challenge, demand, inspire and motivate individuals to take on their own environmental responsibility. It is a constant process of education and action. Strategies and examples are needed which are creative, fun and effective.

For too long, the environment and its protection has been an add on — something to do when we had the time, the money and the interest to pursue. It is almost a recreation rather than a necessity.

The solution is an internal one. For the organization, bureaucracy and company, this means performance appraisal and subsequent compensation must be based on environmental responsibilities. For the individual, positive environmental habits must be rewarded. The solutions have to come from within as that is where the problems lie.

An environmental career is a wonderful one — probably the best — because it is good work. Professionally, the work is as complex, challenging and exciting as any career. Personally, you can go home at night and feel satisfied that you have helped, in a small way, to make the earth a better place to live. That's strong medicine. That is also a strong, bold statement. I wish you well in your pursuits of that statement and thank you for your interest and actions. ■

John R. Cook, Jr. is the Founder and President of The CEIP Fund, Inc., the nation's environmental careers organization. He also sits on the boards of various foundations and non-profit organizations. Mr. Cook holds a BA from St. Lawrence University.

Appendix: Resources for an Environmental Career

Environmental Job Listings

Job Scan (monthly). Contains at least 100 job listings at all levels in environmental fields. Student Conservation Association, PO Box 550, Charlestown, NH 03603.

Environmental Opportunities (monthly). Listing of permanent, seasonal, and internship opportunities around the country, primarily in natural resource management, with nonprofits and government agencies. PO Box 969, Stove, VT 05672.

The Job Seeker (biweekly). Listing of permanent, seasonal, and internship opportunities around the country, primarily in natural resource management with nonprofits and government agencies. Route 2, PO Box 16, Warrens, WI 54666.

Environmental Job Opportunities Bulletin (ten times a year). Listing of job openings with environmental groups, government agencies, nature centers, consulting firms, colleges, and universities around the country. Institute for Environmental Studies, University of Wisconsin, 550 N Park St, Madison, WI 53706.

JOBSource. Computer program with a data base of current professional job vacancies. Specializes in natural resources, nature sciences, agriculture, and liberal arts. If you are a member of the American Fisheries Society or the Wildlife Society, see the listing for JOBSource under Resources in chapter 12. 418 S Howes St, Suite D, Fort Collins, CO 80521.

EcoNet. International computer network serving the environmental community. Has 100 electronic bulletin boards on environmental topics, issues, services, events, news, and so on. One board is a job listing that is constantly updated. 3228 Sacramento St, San Francisco, CA 94115.

General Career Information and Overview

Becoming an Environmental Professional and ***The Complete Guide to Environmental Careers***, The CEIP Fund, Inc., 68 Harrison Ave, 5th Fl., Boston, MA 02111. (617) 426-4375

What Color is Your Parachute?, by Richard Nelson Bolles (annual). A guide to career planning and job searches. If you don't own it, buy it—and read it. Ten Speed Press.

Don't Use a Resume ... Use a Qualifications Brief, by Richard Lanthrop (1980). There are many, many books on resume writing. It would be difficult to do better than this one. Ten Speed Press.

Damn Good Resume Guide, by Yana Parker (1983). Ten Speed Press.

The Way of the Ronin: A Guide to Career Strategy, by Beverly Potter (1984). A discussion of the new work world and the type of employee who would flourish: one who is flexible and willing to make horizontal shifts in career paths, focusing on transferable skills. American Management Association.

State of the World, by Lester R. Brown et all. Annual. Worldwatch Institute.

Environmental Agenda for the Future, Robert Cahn, edt. Island Press, 1985.

Environment Reporter, Bureau of National Affairs, Inc. Good for keeping up on current legislation.

Regional EPA "Events News Letter" Free, and very useful if your region publishes one.

"Meeting Environmental Workforce Needs: Education and Training to Assure a Qualified Workforce." Proceedings of the conference of the same name, April 1985.

Cosponsored by the EPA Tennessee Valley Authority, and *Pollution Engineering Magazine*. Information Dynamics, Inc. 111 Claybrook Dr., Silver Spring, MD 20902

The Solar Jobs Book, by Katharine Ericson (1980). Covers educational programs. Brick House Publishing Co., 3 Main St. Andover, MA 01810

Complete Guide to Finding Jobs in Government, by Daniel Lauber, Planning Communications, 7215 Oak Ave., River Forest, IL 60305

Environmental Protection Careers Guidebook, by EPA and US Department of labor (1980) Includes information on education. US Gov. Printing Office.

Exploring Environmental Careers, by Stanley Jay Shapiro (1982). Has information on two year technician's degrees. Richard Rosen Press, 29 E. 21st St., New York, NY 10010

Opportunities in Environmental Careers, by Odom Fanning (1986). VGM Career Horizons, National Textbook Co., 4255 W. Touhy Ave., Lincolnwood, Ill. 60646

Volunteer! The Comprehensive Guide to Voluntary Service in the US and Abroad, Council on International Exchange Services, Campus Services, 205 E. 42nd St., New York, NY 10017

Professional Associations

National Association of Environmental Professionals. Interdisciplinary professional society. Offers student memberships. Publishes newsletter (monthly) and *The Environmental Professional* (quarterly). PO Box 15210, Alexandria, VA 22309.

Directories

Encyclopedia of Associations (1989). Five volumes: volume 1 (three books), National Organizations of the United States; volume 2, Geographic and Executive Indexes; volume 3, New Associations and Projects. Gale Research.

International Organizations (1989). Focuses on associations that are nonprofit, international in scope and membership, and headquartered outside the United States. Gale Research.

Regional, State, and Local Organizations (1989). Lists local, state, and regional nonprofit membership organizations in the United States and its territories. Gale Research.

Association Periodicals (1989). Describes journals, magazines, bulletins, directories, and other publications issued serially by associations, societies, institutes, and other nonprofit membership organizations. Gale Research.

Directory of Directories (4th ed., 1987). A comprehensive publication whose subtitle explains it all: "An annotated Guide to Approximately 9,600 Business and Industrial Directories, Professional and Scientific Rosters, [and] Directory Databases." Gale Research.

Consultants and Consulting Organizations Directory (1989). Organized according to consulting activity and geographic location. Gale Research.

Conservation Directory, National Wildlife Federation, 1412 16th St., NW, Washington, DC 20036

Peterson's Guides, Two and four year and graduate programs.

Community Jobs, Community Careers Resource Center, 1520 16th St., NW, Washington, DC 20036

Directory of State Environmental Agencies, Environmental Law Institute, 1616 P St., NW, No. 200, Washington, DC 20036

Directory of Volunteer Bureaus and Voluntary Action Centers, Volunteer-The National Center, 1111 N. 19th St., Suite 5000, Arlington, VA 22209

Helping Out in the Outdoors: A Directory of Volunteer Jobs in State and National Forests, Northwest Trails Association, 16812 36th Ave. W., Lynwood, WA 90836

International Directory of Volunteer Work. Vacation Work, 9 Park End St., Oxford, England.

Internships: A Directory of on the Job Training for all Career Fields, Writer's Digest Books, published by F & W Publications, Inc. 1507 Dana Ave., Cincinnati, OH 45207

National Directory of Internships, Large section on Environmental affairs. National Society of Internships and Experiential Education, 3509 Hawworth Dr., Suite 207, Raleigh, NC 27609

World Environmental Directory, Business Publishers, Inc., 951 Pershing Dr., Silver Spring, MD 20910, (301) 587-6300

1989 Summer Employment Directory of the United States, Writer's Digest Books, published by F & W Publications, 1507 Dana Ave, Cincinnati, OH 45207

Data Bases

Directory of Environmental Information, edited by Thomas Sullivan and Richard Hill (1988). Lists and describes over 100 environmental data bases and data services, as well as information on government agencies, professional associations, and periodicals. Government Institutes, 966 Hungerford Dr, No 24, Rockville, MD 20850.

Minorities

The Black Resource Guide (1988). Lists over 1,500 national resources in 36 categories for Black persons. R. Benjamin Johnson and Jacqueline L. Johnson, 501 Oneida Place, NW, Washington, DC 20011.

Directory of Special Programs for Minority Group Members: Career Information Services, Employment Skills Banks, Financial Aid Sources, edited by Willis L. Johnson (4th ed., 1986). Information on 1,700 general programs, 360 federal programs, and hundreds of others sponsored by colleges and universities. Garrett Park Press, PO Box 190-B, Garrett Park, MD 20896.

Job Seekers With Disabilities

Resource Directory of Scientists and Engineers with Disabilities. Intended as a resource for students with disabilities interested in careers in science and engineering. American Association for the Advancement of Science.

Able Scientists—Disabled Persons (1984). Published for the Foundation for Science and the Handicapped. J. Racila Associations, 2820 Oak Brook Road, Oak Brook, IL 60521.

International Employment

The Job Seekers Guide to Opportunities in Natural Resource Management for the Developing World (1986). Describes organizations, opportunities, minimum qualifications, and procedures for employment inquiries. International Institute for Environment and Development, 1717 Massachusetts Ave, NW Suite 302, Washington, DC 20036.

Alternatives to the Peace Corps: Gaining Third World Experience, by Becky Buell and Kari Hamerschlag, Food First: Institute for Food and Development Policy, 145 9th St., San Francisco, CA 94103, (415) 864-8555, $5.

A Guide to Opportunities in International Development, Overseas Development Network SAIS, Washington, DC.

Environmental Protection

- **National Association of Environmental Professionals.** PO Box 15210, Alexandria, VA 22309. Pro. Newsletter, monthly. *The Environmental Professional Journal*, quarterly.

- **American Chemical Society.** 1155 16th St, NW, Washington DC, 20036. Pro. Almost thirty periodical publications including *Environmental Science and Technology*, monthly.

- **American Institute of Chemical Engineers.** 345 E 47th St, New York, NY 10017. Pro. Many periodicals including *Environmental Progress*, quarterly.

- **Environmental Law Institute.** 1616 P St, NW Suite 200, Washington DC, 20036. Pro. *Environmental Law Reporter*, monthly.

- **American Academy of Environmental Engineers.** 132 Holiday Ct, #206, Annapolis, MD 21401. Pro. *The Diplomate*, quarterly.

- **Association of Environmental and Resource Economists.** 1616 P St NW, Washington DC, 20036. Pro. *Journal of Environmental Economics and Management*, quarterly.

- **National Association of Interpretation.** 6700 Needwood Rd, Derwood, M[illegible] 20855. Pro. Newsletter, monthly. Journal, semiannual.

- **American Society for Environmental Education.** PO Box KB, Dana Point, CA 92629. Pro. *Environmental Education Report and Newsletter*, quarterly.

- **North American Association for Environmental Education.** PO Box 400, Troy, OH 45373. Pro. *Newsletter*, bimonthly.

- **Sierra Club.** 730 Polk St, San Francisco, CA 94109. *Sierra*, bimonthly. National News Report, biweekly.

- **Natural Resources Defense Council.** 122 E 42nd St, 45th Floor, New York, NY 10168. *Amicus Journal*, quarterly.

- **Environmental Defense Fund.** 257 Park Ave S, New York, NY 10010. *EDF Letter*, bimonthly.

- **Citizens for a Better Environment.** 33 E Congress, Suite 523, Chicago, IL 60605. *Environmental Review*, quarterly.

- **Environmental Action.** 1525 New Hampshire Ave, NW, Washington DC 20036. *Environmental Action* (magazine), monthly.

- **The Cousteau Society.** 930 W 21st St, Norfolk, VA 23517. *Calypso Log*, bimonthly.

Air Quality

- **Air and Waste Management Association,** PO Box 2861, Pittsburgh, PA 15230. Pro. Journal, monthly.

- **State of California Air Resources Board,** *Employment Opportunities,* 1234 U. St., Sacramento, CA 95818

Water Quality

- **Water Pollution Control Federation.** 601 Wythe St, Alexandria, VA 22314. Pro. *Journal*, monthly.

- **American Water Works Association.** 6666 W Quincy Ave, Denver, CO 80235. Pro. *Journal*, monthly and *Waterworld News*, bimonthly.

- **National Water Well Association.** 6375 Riverside Dr, Dublin, OH 43017. Pro. *Well Log* (newsletter), monthly. *Water Well Journal*, monthly.

- **International Association for Great Lakes Research.** c/o Institute of Science and Technology, 2200 Bonisteel Blvd., University of Michigan, Ann Arbor, MI 48109. Pro. *Journal of Great Lakes Research*, quarterly.

◆ **Association of Ground Water Scientists and Engineers**, 6375 Riverside Drive, Dublin, OH 43017. Pro. *Journal of Ground Water*, bimonthly.

◆ **American Water Resources Association**, *Water Resources Bulletin*, *1988 Survey of Employment Opportunities in Water Resources*. 5410 Grovsenor Lane, Suite220, Bethesda, MD 20814

Monthly Journal of the Water Pollution Control Federation. 601 Wythe St. Alexandria, VA 22314

US Water News (monthly), *Journal of Fresh Water* (annual), *Facets of Fresh Water* (quarterly). 2500 Shadywood Rd., Box 90. Navarre, MN 55392

Solid Waste Management

◆ **National Solid Wastes Management Association**. 1730 Rhode Island Ave, NW, Suite 1000, Washington, DC 20036. Pro. *Waste Age*, monthly.

The Management of World Wastes (monthly), Communication Channels, Inc. 6255 Barfield Rd., Atlanta, GA 30328

Resource Recycling (seven times a year), PO Box 10540, Portland, OR 97210

Recycling Today (Monthly), GIE Publishing, 4012 Bridge Ave., Cleveland, OH 44113

Solid Waste Report (weekly), Business Publishers, Inc., 951 Pershing Dr., Silver Spring, MD 20910

Solid Waste Reporter (bimonthly), HCI Publications, Inc. 410 Archibald, Kansas City, MO 64111

Hazardous Waste Management

◆ **Hazardous Materials Control Research Institute**. 9300 Columbia Blvd, Silver Spring, MD 20910. Pro. *FOCUS* (newsletter), monthly. *Journal on Hazardous Waste and Hazardous Materials*, quarterly.

◆ Air and **Waste Management Association** (See Air Quality for listing).

◆ **Chemical Manufacturers Association**, *Chemecology*, (free) 2501 M. St., NW, Washington, DC 20037

◆ **American Chemical Society**, *Chemical and Engineering News* (weekly), *Environmental Science and Technology* (monthly), *Chemical Abstracts*. 1155 16th St., NW, Washington, DC 20036

◆ **Citizen's Clearinghouse for Hazardous Wastes**, Inc., *Action Bulletin* (quarterly), PO Box 926, Arlington, VA 22216.

Pollution Engineering: The Magazine of Environmental Control (monthly), Pudvan Publishing Co., 1935 Shermer Rd., Northbrook, Il 60062.

Focus, Journal on Hazardous Waste and Hazardous Materials (quarterly), 9300 Columbia Rd., Silver Spring, MD 20910

Environmental Health

◆ **National Environmental Health Association**. 720 S Colorado Blvd, Suite 970, South Tower, Denver, CO 80222. Pro. *Journal of Environmental Health*, bimonthly.

◆ **American Industrial Hygiene Association**. 475 Wolf Ledges Pkwy, Akron, OH 44301. Pro. Journal, monthly.

◆ **American Public Health Association**. 1015 15th St, NW, Washington DC, 20005. Pro. *American Journal of Public Health*, monthly.

◆ **Society of Environmental Toxicology and Chemistry**. 1133 15th St, NW, Suite 1000, Washington DC, 20005. Pro. *Environmental Toxicology and Chemistry*, quarterly.

Resource Management

- **Friends of the Earth.** 530 Seventh St, SE, Washington, DC 20003. *Not Man Apart*, bimonthly.
- **The Nature Conservancy.** 1800 N Kent St, Suite 800, Arlington, VA 22209. Magazine, bimonthly.
- **Wilderness Society.** 1400 Eye St, NW, Washington, DC 20005. *Wilderness*, quarterly.
- **Izaak Walton League of America.** 1701 N Fort Myer Dr, Suite 1100, Arlington, VA 22209. *League Leader* (newsletter), bimonthly. Outdoor America, quarterly.
- **Greenpeace U.S.A.** 1611 Connecticut Ave, NW, Washington, DC 20009. *Greenpeace Examiner*, quarterly.
- **Ecological Society of America.** c/o Center for Environmental Studies, Arizona State University, Tempe, AZ 85287 Pro. *Ecology*, bimonthly.
- **Botanical Society of America.** c/o David L. Dilcher, Biology Department, Indiana University, Bloomington, IN 47405. Pro. *American Journal of Botany*, monthly.
- **Soil and Water Conservation Society,** *Journal of Soil and Water Conservation* (bimonthly), 7515 NE Ankeny Rd., Ankeny, Iowa 50021
- **National Association of Conservation Districts,** *Tuesday Letter* (weekly), *Guide to Conservation Careers* (1984), 509 Capitol Court, NE Washington, DC 20002
- **American Land Resources Association,** *American Land Forum* (bimonthly), 1516 P. St., NW, Washington, DC 20033
- **Natural Resources Council of America,** 1*NRCA News* (monthly), Natural Resources Council of America, 1015 31st St., NW, Washington, DC 20007

Fisheries

- **American Fisheries Society.** 5410 Grosvenor Lane, Bethesda, MD 20814. Pro. *Fisheries* (bulletin) bimonthly. North American Journal of Fisheries Management quarterly.
- **International Association of Fish and Wildlife Agencies.** 444 N Capitol Street, N.W., Suite 534, Washington DC, 20001. Pro. Newsletter, bimonthly.
- **Trout Unlimited.** 501 Church St, NE, Vienna, VA 22180. *Lines to Leaders* (newsletter) monthly.

Forestry

- **Society of American Foresters.** 5400 Grosvenor Lane, Bethesda, MD 20814. Pro. *Journal of Forestry*, monthly. Forest Science, quarterly.
- **Association of Consulting Foresters.** 5410 Grosvenor Lane, Suite 250, Bethesda, MD 20814. Pro. *The Consultant*, quarterly.
- **Municipal Arborists and Urban Foresters Society.** PO Box 1255, Freehold, NJ 07728. Pro. *Newsletter*, bimonthly.
- **American Forestry Association.** 1516 P Street St, NW, Washington, DC 20005. *American Forests Magazine*, (monthly), *So You Want to Be in Forestry?* (free), *Directory of Urban Forestry Professionals.*
- **International Society of Arboriculture,** *Journal of Arboriculture* (monthly), PO Box 71, 5 Lincoln Sq., Urbana, IL 61801
- **National Arborists Association,** *The Reporter* (monthly), Meeting Place Mall, Route 101, PO Box 1094, Amherst, NH 03031

Timber Harvesting, Hatton Brown Publishers, PO Box 2268, Montogomerry, AL 36197

Wildlife

- **Wildlife Society**. 5410 Grosvenor Lane, Bethesda, MD 20814. Pro *Wildlifer*, bimonthly. *Journal of Wildlife Management*, quarterly.
- **National Wildlife Federation**, 1412 16th St, NW, Washington, DC 20036. A variety of biweekly, monthly and bimonthly publications.
- **National Audubon Society**. 950 Third Ave, New York, NY 10022. Audubon (magazine), *American Birds*, bimonthly.
- **Defenders of Wildlife**. 1244 19th St, NW, Washington DC 20036. *Defenders Magazine*, bimonthly.
- **World Wildlife Fund**. 1250 24th St, NW, Washington, DC 20037. *Focus* (newsletter), bimonthly.
- **Trout Unlimited**, *Lines to Leaders* (monthly), 501 Church St., NE, Vienna, VA 22180
- **International Association of Fish and Wildlife Agencies**, Newsletter (bimonthly), 444 N. Capital St., NW, Suite 534, Washington, DC 20001
- **Fish and Wildlife Reference Service**, computerized information retrieval system. Sterling Software, PO Box 6044, Rockville, MD 20850

Wildlife and Fisheries: Career Opportunities (1986), West Wind Productions, Inc.

Land and Water Conservation

- **Soil and Water Conservation Society**. 7515 NE Ankeny Road, Ankeny, IA 50021. Pro. *Journal of Soil and Water Conservation*, *Conservogram*.
- **National Association of Conservation Districts**. 509 Capital Ct, NE, Washington, DC 20002. Pro. *Tuesday Letter*, weekly.
- **Land Trust Exchange**. 1017 Duke St, Alexandria, VA 22314. *Exchange*, quarterly.
- **Trust for Public Land**, 116 New Montgomery St, San Francisco, CA 94105. *Update*, three per year.

Parks and Recreation

- **American Park and Recreation Society**. 1800 Silas Deane Hwy #1, Rocky Hill, CT 06067. Pro. *Keeping You Current*, quarterly.
- **National Society for Park Resources**. 3101 Park Center Dr, Alexandria, VA 22302. Pro. *Recreation and Parks Law Reporter*, quarterly.
- **National Recreation and Park Association**. 3101 Park Center Dr, 12th Floor, Alexandria, VA 22302. **Parks and Recreation Magazine**, monthly. *Job Opportunities Bulletin*, monthly.
- **National Parks and Conservation Association**. 1015 31st St, NW, Washington, DC 20007. *National Parks* (magazine), bimonthly.
- **American Park Rangers Association**. c/o D Shepherd, 220 NE 19th St, Homestead, FL 33030. Pro. **American Park Ranger Newsletter**, quarterly.

Urban And Regional Planning

- **American Planning Association**. 1776 Massachusetts Ave, NW, Washington, DC 20036. Pro. *Job Mart*, semimonthly. Planning Magazine, monthly.
- **The Urban Land Institute**. 1090 Vermont Ave, NW, Washington, DC 20005. *Land Use Digest*, *Urban Land*, monthly.
- **American Society of Consulting Planners**. 210 7th St SE, Suite 647. Washington, DC 20003. Pro. Newsletter, monthly.
- **Metropolitan Association of Urban Designers and Environmental Planners**. PO Box 722, Church St Station, New York, NY 10008. Pro. Newsletter, periodic.

◆ **American Society of Landscape Architects.** 1733 Connecticut Ave, NW, Washington, DC 20009. Pro. *Landscape Architectural News Digest*, monthly.

◆ **Association of American Geographers.** 1710 16th St, NW, Washington, DC 20009. Pro. Newsletter, 10/year. *Professional Geographer*, quarterly.

◆ **Partners for Livable Places.** 1429 21st St, NW, Washington, DC 20036. *PLACE*, bimonthly.

◆ **Association of Collegiate Schools of Planning.** *Guide to Graduate Education In Urban And Regional Planning* (available through APA), by Carl V. Patton and Kathleen Reed (5th ed., 1986). .

Education:

The Alliance Exchange (quarterly), Box 1040, 3421, M. St. NW, Washington DC. 20007

The Environmental Communicator (bimonthly), lists internship and employment opportunities and works to promote environmental education. PO Box 400, Troy, Ohio 45373

New for 1990

Environmental Career Articles

Environmental Employment Trends in the 1990s
Maureen A. Delaney, Director, National Recruitment Program
Clarice E. Gaylord, Ph.D., Deputy Director, Office of Human Services
U.S. Environmental Protection Agency

Environmental Professionals
Robert Ehrhardt, President, ***National Association of Environmental Professionals***

Becoming an Environmental Lawyer
John Adams, Executive Director
Nina Sankovitch, Coastal Project Attorney
Natural Resources Defense Council

International Environmental Protection
Thomas Fox, Director, Center for International
Development and the Environment, ***World Resources Institute***

Pollution Prevention Versus Remediation
Dana Duxbury, President, ***Dana Duxbury and Associates***

Minority Participation
Gerry Stover, Executive Director, ***The Environmental Consortium for Minority Outreach***

Liberal Arts Education
Alan Schwartz, Director, Environmental Studies Program,
St. Lawrence University

Changing Careers
Barbara Gilvar, Principal, ***Isaacson, Miller, Gilvar & Boulware, Inc.***

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